

z/OS



# Hardware Configuration Manager User's Guide



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**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 395.

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This edition applies to Version 1 Release 3 of z/OS (5694-A01) and to all subsequent releases and modifications until otherwise indicated in new editions.

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## About This Book

This guide explains how to use **Hardware Configuration Manager (HCM)** for z/OS, a comprehensive, graphical hardware configuration and operations tool available for IBM and compatible S/390 systems. HCM allows system administrators to easily and efficiently manage all information about the hardware and connectivity of their systems.

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## Who This Book Is For

The *HCM User's Guide* explains to system administrators, system programmers, system operators, system planners, and your hardware support staff how to install and use HCM to create and maintain hardware configuration information.

It is assumed that the person who is responsible for defining and managing hardware configuration for a z/OS system has basic knowledge of z/OS and hardware configuration.

For information on configuration planning for z/OS, refer to *z/OS HCD Planning*.

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## How This Book Is Organized

This book contains the following chapters:

**Chapter 1, "Overview" on page 1**

summarizes HCM's major features and benefits.

**Chapter 2, "Installing HCM" on page 3**

explains in detail how to install the software.

**Chapter 3, "Getting Started" on page 27**

explains how to use the configuration diagram, dialogs, menus and reports, as well as the mouse and keyboard shortcuts in HCM.

**Chapter 4, "Building Your Configuration" on page 49**

describes the relationship between HCM and HCD (IODFs, config files); explains physical and logical objects; provides information on how to use HCM for the first time (creating a new configuration from an IODF or from scratch), how to open an existing configuration and how to save, close or copy the configuration.

**Chapter 5, "Standalone Mode" on page 71**

explains how to invoke and work with the stand-alone mode.

**Chapter 6, "Modifying Objects in Your Configuration" on page 77**

explains how to manipulate all the elements of your hardware configuration with the interactive configuration diagram and dialogs: processors, partitions, CHPIDs, controllers, control units, strings, units, devices, converters, directors, crossbar switches, cabinets and patchports.

**Chapter 7, "Connecting Objects in Your Configuration" on page 127**

explains how to connect and define logical objects.

**Chapter 8, "Physical Connections" on page 155**

explains how to add purely physical objects to existing connections: cables, patchports, and crossbar switches.

- Chapter 9, "Utilities" on page 169**  
describes utilities HCM provides to make complex configuration tasks easier.
- Chapter 10, "Operating System Configurations" on page 173**  
explains how to specify OS configurations, EDTs, esoteric device groups and generic device groups, as well as how to define I/O devices to the OS configuration.
- Chapter 11, "User Interface to I/O Operations" on page 187**  
describes how HCM can function as a graphical user interface to I/O Operations (ESCON Manager) on the host.
- Chapter 12, "Reports and Diagrams" on page 193**  
describes how to print a variety of reports, context diagrams and configuration diagrams from HCM, and gives examples.
- Chapter 13, "Scenarios" on page 231**  
contains a number of configuration scenarios, step-by-step, for you to follow.
- Chapter 14, "HCD-Only Tasks" on page 279**  
lists the tasks which cannot be carried out using HCM.
- Chapter 15, "Importing and Exporting Data" on page 283**  
explains how to exchange data between your processes, application, and data bases and the configuration data of HCM via ASCII files.
- Chapter 16, "Providing Input to the Tivoli Inventory Data Base" on page 331**  
describes how to set up Tivoli Inventory to use configuration data of S/390 processor configuration.
- Chapter 17, "Physical Description Files (PDFs)" on page 339**  
describes the different PDFs and their syntax.
- Chapter 18, "Problem Determination" on page 345**  
explains how to diagnose problems that may arise using HCM.
- Appendix A, "HCM Messages" on page 355**  
contains all HCM messages.
- Appendix B, "Alternate Processor Definitions" on page 367**  
explains how HCM handles multiple logical processors in one physical machine.
- Appendix C, "'One Processor Per Partition' Machines" on page 369**  
explains how HCM handles machines not represented in IBM's processor partitioning scheme.
- Appendix D, "Naming Conventions in Dialogs and Reports" on page 373**  
shows how objects in HCM are usually described.
- Appendix E, "Menu Commands Summary" on page 377**  
lists all commands that can be used in the different menus.
- Appendix F, "Table Description for Tivoli Inventory Support" on page 381**  
describes the tables that are added to the Tivoli Inventory database in order to store the HCM exported data.
- Appendix G, "Special Setup Considerations" on page 389**  
discusses special considerations related to setup.

## Appendix H. Accessibility

discusses special features that help users who have a physical disability to use the software successfully.

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## Related Information

For an overview of the documentation associated with z/OS, see the *z/OS Information Roadmap*, SA22-7500.

Please see also our HCM home page

**<http://www.ibm.com/servers/eserver/zseries/zos/hcm>**

which provides information concerning product updates, newsletters, conferences and more.

For more information on HCD, see *z/OS HCD User's Guide*.

---

## Service Levels

From time to time, IBM makes available service levels to update HCM. These service levels are numbered in ascending order according to their release date. A new service level comprises new updates as well as all updates reflected in earlier service levels. That is, you only have to install the newest service level to obtain all product updates. Always see the EEQREAD.ME file before you use the new service level. It resides in the product directory after you have installed the service level.

For information on service levels, see the HCM home page

**<http://www.ibm.com/servers/eserver/zseries/zos/hcm>**



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## Summary of Changes

This book contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

This section lists the changes that have been made to HCM with various operating system releases.

---

### What is New in HCM for z/OS Version 1 Release 3

#### Note

This release of z/OS does not include a new release of HCM. HCM Release 2.9.0 remains the current release.

#### Note

An appendix with z/OS product accessibility information has been added.

### Cascaded Switch Support

Cascaded connections between FICON switches are supported. This means that a control unit to a FICON channel path connection can now run through two or more FICON switches. Therefore, a switch address must be specified for the single FICON switches of the fabric. HCM also supports explicit upgrading from one-byte link addresses to two-byte link addresses as well as down-grading of two-byte link addresses to one-byte link addresses via a new utility.

### FCTC (FICON Channel to Channel) Support

Two FC channels might be connected with each other to establish an FCTC connection. At least one FC channel path must be connected to a 2064 processor type in order to provide a valid FCTC connection. HCM together with HCD ensures that this rule is obeyed.

### Support for IQDIO Channel Paths

HCM allows you to specify the maximum frame size for IQD channel paths. HCM's reports have been enhanced so that they contain the maximum frame size (where appropriate).

### Support for PPRC (Peer to Peer Remote Copy)

HCM's support consists of the following elements:

- Document direct physical connections between serial interfaces on controllers. These connections may pass through directors and patchports.
- Maintain logical connections between subsystems, including through directors.
- Ability to share PPRC data with other tools (like GDPS and RCMF). HCM can export and import CESTPATH commands and GEOPARM control statements.

In order to create a PPRC connection, HCM offers you a wizard where you create a PPRC connection step by step. You can add an SSID (Subsystem Identifier) to

control units, and selected physical description files have been updated to include SAID (System Adapter Identifier) information. See also “Connecting Controllers to Controllers (PPRC Connections)” on page 141.

## Other Changes

Other improvements are as follows:

- In the *Preferences* menu (selectable via *View*), you can now switch between vertical and horizontal lines as well as diagonal lines for displaying connections between objects in the diagram. HCM also prints these diagonal lines if they are selected. Together with the option *Compress diagram horizontally* found in the *Preferences* dialog, the number of pages that HCM needs for printing often gets reduced.
- Both the *Select Connection Target(s)* and the *Edit Fiber Link* dialogs have been updated to display a cabinet’s description.
- The following dialogs have been enlarged to display more information:
  - Edit String
  - Controller
  - Control unit <=> Processor Definitions
  - Control Unit List
  - Switch
  - Select Connection Target(s) from patchports
  - Select CHPID for CTC Connection
  - Crossbar Switch
  - Edit Crossbar Control Unit Interface
- Support for a number of devices column in the *Edit/Locate CHPID* dialog has been introduced. Also, the Processor Summary and Channel Path Connections reports display this column.
- The message text for disconnecting a patchport that has been permanently connected is improved. The message now reads: “%s may not be removed from its fiber link because %s is permanently connected all the way to %s. Use the Connection is Permanent option on the Assign Cable dialog to change the connection type.”
- The Cabinet reports have been enhanced. It is now recommended to print this as a separate report using Landscape. The number of columns is calculated based on paper size.

---

## What is New in HCM for z/OS Version 1 Release 1

### Note

This release of z/OS does not include a new release of HCM. HCM Release 2.9.0 remains the current release.

## Dynamic Channel Path Management (DCM)

As part of the z/OS Intelligent Resource Director, Dynamic Channel Path Management allows the system to dynamically re-assign channel paths to connected control units based on the current work load and its service goals. HCM allows channel paths to be designated as static (fixed) or managed (re-assignable) when they are defined.

## New Utility to Prime IODF with Sensed Data

See "Priming the IODF with Sensed Data" on page 172.

## Other Changes

Other improvements are as follows:

- **Change of filename extension for Physical Description Files.**  
The filename extension for physical description files was changed from ".pdf" to ".txt" for HCM 2.9 Service Level 3 and higher. Nevertheless, HCM 2.9 Service Level 3 and higher can still read physical description files having the extension ".pdf".
- **Selective cabinet reports.**  
The Front View and Back View of patchports can be printed separately.
- **Loading HCM configuration files.**  
A HCM configuration file (either \*.hcm or \*.hcr) will automatically be loaded with HCM if you double-click with the left mouse button on the HCM configuration file in the Windows Explorer, for example.
- **Processor and CHPID Connections dialog.**  
The **Reachable CHPIDs** dialog has been replaced by the **Processor and CHPID Connections** dialog in order to provide a better overview of which channel paths the object under focus will connect with. The new dialog contains a tab for each processor, where all CHPIDs reachable from that processor are listed. Additionally, the new dialog allows specifying the number of managed CHPIDs of each processor to which the object of interest should be connected. A summary tab shows the processor definitions for the object under focus, so that you can easily verify that all connections you want to establish will be defined after pressing the 'OK' button.

---

## What is New in HCM for OS/390 Version 2 Release 9

### Physical Connectivity Enhancements

HCM has been enhanced to allow the following:

- Permanent and/or anonymous trunk connections can be made between patchports and director ports.
- Connection changes are possible without having to rebuild all or most of the ESCON link information.
- Infrastructure connections can be established after an IODF load.
- Multiple patchports can be disconnected simultaneously.

As a result of these enhancements, HCM will now differentiate serial connections as "permanent" or "mutable."

The idea is that infrastructure connections such as trunk cables from processors to cabinets can be marked as permanent so that HCM can prevent them from being disconnected during normal connect/disconnect procedures. Other connections can be marked as "mutable" so that HCM will know that these are positions at which connections can be broken.

### I/O Operations Graphical User Interface in HCM

HCM has been enhanced to allow interaction with I/O Operations via HCD for viewing active hardware and ESCON director information. The following new HCM functions have been introduced:

- Graphical view of the active sysplex and its status.

- Manipulation of director matrices.
- Activation of a changed director matrix.
- Issuing I/O Operations commands and viewing the result.

## Save List in Edit & Locate Windows

The **Locate** object and **Edit** object windows contain a new **Save As...** button. This allows all the listed objects, including the displayed columns, to be saved to a file in a format, that can, for example, be used by a spreadsheet program (such as Lotus 1-2-3).

## Color Printing

HCM now provides the capability of printing hard copies of diagrams in the same colors that appear on the screen.

## Generation of a Director Matrix

HCM provides a new checkbox **Generate default matrix** in the **Create Configuration for Director nn** dialog box that will engage HCD to create a director matrix with appropriate "allows" and "prohibits" based on the IODF information.

## Multiple Delete

HCM has always permitted selection of several objects for "cropping", but until now it has only supported deletion of a single selected object. It is now possible to delete (disconnect) all the objects selected by pressing the DEL key (or by selecting the **Delete** option from the **Edit** menu).

## Other Changes

Other improvements are as follows:

- **Comment field in cable assignments dialog.**  
HCM now provides a 32-character editable comment field in the "Assign Cable" dialog. It is visible in the "Cable Assignments" and "Locate Cable" dialog windows.
- **Deeper zooming.**  
HCM has improved the readability of the diagram text on the screen.
- **IODF information in report.**  
When printing a hardcopy report, HCM now includes descriptive information about the associated IODF.
- **Unused cable report.**  
HCM now provides the capability of including unused cables in the hardcopy reports.
- **Selective cabinet reports.**  
Cabinet reports can be limited to selected cabinets.
- **Popup menus.**  
Context-sensitive popup menus have now been provided. They can be accessed with the right mouse key.
- **Refresh background.**  
This option is no longer provided. Once the last dialog has been closed, the diagram will always be completely repainted and hence up-to-date.

- **Disconnect of mutable connections**

When disconnecting an ESCON link with more than one mutable connection, a dialog is now presented allowing you to select the mutable connection to be deleted.

---

## What is New in HCM for OS/390 Version 2 Release 7

### New Utilities

HCM offers you new utilities that make complex and time-consuming tasks easier.

#### Moving Ports

This utility allows moving CHPID-to-control-unit connections that have a path through an ESCON director from one director to another, or rearranging such connections on a single director. The advantage is that you no longer have to manually disconnect and connect the individual objects involved.

#### Aggregating CHPIDs

This utility allows you to combine attachments of several CHPIDs onto a single CHPID. That is, all control units connected to the source CHPIDs will be disconnected from the source CHPIDs and connected to a target CHPID. That is possible for all CHPIDs connected to the same director.

#### Migrating CNC to FICON Channels

This utility supports you in making the necessary I/O configuration changes, if a new FICON bridge card is installed on an ESCON director. HCM especially supports you if CHPID-to-control-unit connections have to be moved from one port to another port, or if CHPID-to-control-unit definitions have to be aggregated from several CHPIDs to a new FICON CHPID.

### New Operating System Support

HCM now runs as a native 32 bit application under Windows NT Version 4.0 and Windows 95 or higher. This provides the following benefits:

- Long file names are supported
- Multitasking behavior: Other applications can run while HCM is performing long operations

You can continue to use your current config files.

### Network Protocol Enhancements

Besides APPC, you can now also use TCP/IP as a network protocol to communicate with the HCD server on the OS/390 host.

The APPC communication component has been improved. To use APPC communication you have to provide an updated TP profile.

You do not need data set SYS1.SCBDCOMM on the host any longer.

### Navigation Improvements

HCM offers you improvements while viewing and navigating through your configuration diagram.

#### Consolidated View menu

The action **Filter Diagram...** under the **View** menu has been enhanced. The now-called dialog **Change**

<b>Named Views</b>	<p><b>View Attributes</b> lets you specify all aspects of a configuration's visibility in one single dialog.</p> <p>Using the HCM filter techniques you can tailor a view in such a way that only objects of interest are visible. You can now save such a view for later reuse. It is possible to save more than one view, thus you can have a set of named views that show different aspects of a configuration.</p>
<b>Enhanced Filter Capability</b>	<p>When choosing <b>Edit...</b> and <b>Locate...</b> actions from the Menu bar, you now get a dialog that allows you to sort the listed objects according to their attributes and to reduce the list using a filter.</p>

## Visualizing ESCON Director Matrix Information

HCM can now visualize information from ESCON director or crossbar switch configurations. The diagram now shows dedicated connections or blocked ports. In addition, when highlighting objects in a diagram, HCM can now use the director configuration data to show what particular route is used for CHPID-to-control-unit definitions. This is especially important when there are definitions in the configuration that have more than one possible physical route from the CHPID to the control unit, for example, when chained directors are involved.

## Enhancements to Editing Director Configurations

The presentation of director configurations as a matrix has been significantly improved. The presentation now makes effective use of information of the whole HCM configuration and shows, for example, whether a connection between ports is logically defined by the configuration or not, or whether a connection requires a dedicated connection or might have a dynamic connection.

Furthermore, the enhancements allow you to filter and rearrange ports within the matrix according to your needs.

## Tivoli Inventory Support

HCM provides support for storing configuration data of S/390 processor configurations in the Tivoli Inventory data base.

## Creating Cabinets with Variable Sized Panels

You can now create cabinets to contain patch panels with variable individual size. This allows you to have a mixture of panels with different sizes within one cabinet.

---

## Chapter 1. Overview

Traditionally, hardware configuration is carried out on the z/OS host using Hardware Configuration Definition (HCD). With HCD you can define the hardware configuration for both the channel subsystem and the operating system. The configuration you define with HCD can consist of multiple processors, each containing multiple partitions. HCD stores the entire configuration data in a central repository, the Input/Output definition file (IODF). The IODF as single source for all hardware and software definitions for a multi-processor or multi-partition system is used to build the IOCDs using the IOCP program and to IPL the operating system.

The z/OS Hardware Configuration Manager (HCM) is a PWS (programmable workstation) based client/server interface to HCD that combines the logical and physical aspects of z/OS hardware configuration management.

In addition to the logical connections, you can also manage the physical aspects of a configuration. For example, you can effectively manage the flexibility offered by the ESCON/FICON infrastructure (cabinet, cabling). All updates to your configuration are done via HCM's intuitive graphical user interface and, most important, due to the client/server relationship with HCD, all changes of the logical I/O configuration are written into the IODF and fully validated and checked for accuracy and completeness by HCD, thus avoiding unplanned system outages due to incorrect definitions. HCM also allows you to display operational data such as system status information and operate on the switch via an interface to the I/O Operations function of System Automation on the host.

For more information on how HCM and HCD work together, see Chapter 4, "Building Your Configuration" on page 49.

---

### Physical and Logical Data in One Place

HCM presents an interactive configuration diagram which allows you to maintain not only the logical connectivity data in the IODF, but also the *physical information about a configuration*. The logical information in the IODF represents the operating system and the channel subsystem definitions; the physical information - cabinets, patchports, crossbar switches, cables, locations and so on - adds the infrastructure to the logical data.

Furthermore, the logical and physical information for each object in the configuration *match* because they are created by the same process. When you create an object, you add its logical and physical information at the same time. When you connect, for example, a controller to a processor, the selected control units are logically defined to the selected CHPID through a controller channel interface; the physical connection, including the cable, is displayed visually in the configuration diagram.

Finding and fixing configuration problems is made much easier since physical and logical information cannot diverge. You can, therefore, use HCM to accurately represent your hardware configuration, by supplementing the IODF data.

## Easy to Use

HCM's intuitive graphical user interface allows you to navigate easily around the configuration diagram and dialogs to edit information. You can readily create or delete objects, including physical-only objects such as cabinets, patchports, crossbar switches or converters. You can modify any object: editing is as simple as double-clicking on the desired object in the configuration diagram, and adjusting its information in the resulting dialog. After you have created or modified objects, you can physically connect and logically define them. HCM will intelligently adjust the positions of objects in the diagram to clearly display all connections. You can also generate reports and wall charts to analyze, plan, and implement changes to your configuration.

You can tailor your view of the diagram to display only the objects of interest. Zoom in to focus on one area of the diagram, or crop, reorder, show or hide selected objects. HCM will highlight all connections to selected objects.

Although you can perform nearly all configuration tasks in HCM, some functions such as activating a configuration must be done in HCD (see Chapter 14, "HCD-Only Tasks" on page 279).

## Accurate System Configuration

The data you define with HCM is used to activate your system. You can use the same data to automatically generate reports and diagrams, eliminating inconsistencies and ensuring accurate documentation of system definitions. By skipping the tedious process of manual data entry, you make fewer errors and save significant amounts of time.

## Support for Different User Groups

HCM addresses the needs of several different user groups involved in configuration management. *System programmers* can use HCM to more easily create and edit configuration definitions that have been traditionally maintained in HCD. For example, HCM supports control unit and device definitions by proposing default parameters.

*Hardware support groups* can use HCM to add physical data to the configuration; for example, cabinets and patchports which are not dealt with in the IODF.

*System planners* can generate reports and diagrams to develop future and/or alternate configurations for planning purposes.

*Operators* can conveniently retrieve information about the active status or about objects in the configuration of a system, and can perform operation tasks on the switch. It is thus possible for the operators to have immediate access to an overview of the configuration to help them analyze and solve problems (this is also possible when HCM is running in stand-alone mode).

---

## Chapter 2. Installing HCM

### Overview

This chapter explains how to:

- Migrate to HCM 2.9.0
- Install HCM
- Uninstall HCM
- Set up a TCP/IP connection
- Set up an APPC connection

The installation of HCM is performed in three steps:

#### 1. Install HCM on the host

This procedure is performed by the system administrator at the host and is described in the *z/OS Program Directory*.

#### 2. Install HCM on the workstation

This process is described in this chapter. Before you start this procedure ensure that you meet the requirements as stated in “Prerequisites”.

#### 3. Set up the TCP/IP or APPC definitions

HCM allows you to use either TCP/IP or APPC as a connection between the workstation and the host.

- If you decide to use TCP/IP, then follow the steps described in “Alternative 1: Setting Up TCP/IP Definitions for z/OS” on page 7.
- If you decide to use APPC, then follow the steps described in “Alternative 2: Setting up APPC Definitions for z/OS” on page 13.

For detailed information, refer to the respective product documentation.

---

## Prerequisites

The following requirements must be met to run HCM.

### Workstation Hardware Requirements

HCM runs effectively on a PWS (programmable workstation) with at least a Pentium 133 MHz and 32 Mbytes of RAM. Further requirements are:

- About 50 Mbytes of free disk space
- Color display (1024 x 768 resolution is recommended - 800 x 600 minimum)
- VGA display driver
- Communication adapter card

### Software Requirements

The following software requirements must be met to run HCM.

#### Workstation

On your workstation (PWS) you need the following:

**Operating System:** You need to run one of the following operating systems:

- Windows 95 or higher
- Windows NT Version 4.0 or higher

- Windows 2000
- Windows XP

**Host Communication:** Either TCP/IP or APPC is required.

- TCP/IP communication: TCP/IP networking protocol must be installed (delivered with Windows 95 or higher or Windows NT). To use HCM with TCP/IP connection, UNIX System Services and TCP/IP must be running and the HCM userid must be set up to entitle it to access the UNIX System Services.  
**Note:** Superuser authority is not necessary, but a home directory is to be provided for the user.
- APPC communication: IBM Personal Communication AS/400 and 3270 for Windows 95, Windows NT (Version 4.11 or higher) is required.

**HCM Installation:** You need a method to download the code from the host to the workstation (for example, FTP or PCOMM).

**Tivoli Inventory Support:** If you want to use the Tivoli Inventory support (optional), you need the following:

- The HCM workstation must be made a PC Managed Node of a Tivoli Management Region (TMR). The appropriate PC Agent and the Tivoli Inventory PC Scanning Program must be installed to make the HCM workstation a PC Managed Node.
- HCM supports version 3.2 of Tivoli Framework and Tivoli Inventory. The following patches must be installed:
  - 3.2-TMP-0023
  - 3.2-INV-0001

## Host

HCM is a client/server application using HCM on the host as its server. The communication protocol between the workstation and the host is either TCP/IP or APPC. Although HCM 2.9.0 is shipped with z/OS Version 1, it can communicate with an HCD of OS/390 1.3 or higher. HCM detects whether all HCM functions can be run with a backlevel HCD or whether PTFs need to be installed.

The following table shows the PTFs that need to be installed for various operating system releases.

*Table 1. PTFs*

Release	PTF
OS/390 1.3 OS/390 2.4	UW59395, UW90513, UW90659, UW90675, UW71632, UW73138, UW69958, UW68963, UW68964, UW68909, UW68641, UW99289, UW67003, UW67005, UW67006, UW77044, UW67837, UW67840, UW67841
OS/390 2.5 OS/390 2.6 OS/390 2.7 OS/390 2.8	UW59389, UW90514, UW90662, UW90676, UW75314, UW74688, UW71633, UW99304, UW99305, UW99306, UW69959, UW68997, UW68955, UW68642, UW99341, UW99342, UW99343, UW99290, UW99291, UW99292, UW67004, UW67007, UW67008, UW67838, UW67842, UW67843, UW76394, UW76451, UW76452, UW99393, UW99392, UW99391, UW77045

Table 1. PTFs (continued)

Release	PTF
OS/390 2.9 z/OS 1.3	UW65627, UW75342, UW74689, UW73140, UW71634, UW99307, UW99308, UW69960, UW68998, UW68962, UW68656, UW99344, UW99345, UW99293, UW99294, UW67839, UW67844, UW76423, UW76445, UW76450, UW90706, UW90707, UW99394, UW99395, UW77051, PTFs for OW48236

**I/O Operations Functions:** To be able to use the *I/O Operations* functions offered in HCM, (see Chapter 11, “User Interface to I/O Operations” on page 187) the ESCON Manager Version 1 Release 3 (including PTFs UN94223 and UN94761) or higher, or System Automation for OS/390 (I/O Operations) must be installed and running.

**Note:** Access to the *I/O Operations* tasks is not possible with HCD versions earlier than OS/390 Version 2 Release 9 HCD.

## Migrating from an Earlier HCM Release

You can keep your config files from earlier releases. They are automatically upgraded when you access them with the new HCM release.

**Note:** The EEQHCM.INI file is kept from an earlier release and is used by the new HCM (HCM uses the EEQHCM.INI file to store information and defaults across HCM sessions).

The following describes what to do when updating from earlier HCM releases to the current release.

### Migrating from OS/390 Version 2 Release 7 HCM

If you migrate from OS/390 Version 2 Release 7 HCM, there are no special migration considerations. Just proceed as described in “Installing HCM” on page 6.

### Migrating from a Release Prior to OS/390 Version 2 Release 7 HCM

If you have installed a version of HCM earlier than OS/390 Version 2 Release 7 HCM, you first have to uninstall the older version. Uninstall the older HCM version using the Installation Utility as described in the respective HCM User’s Guide. Do not delete the HCM product files manually.

After uninstalling HCM, install z/OS Version 1 HCM as described in “Installing HCM” on page 6.

If you intend to use APPC as a communication protocol, you must create a new TP profile or update your existing TP profile. For details see “Step One: Define TP Profile” on page 14

---

## Installing HCM

Before you can install HCM on your workstation, the code needs to be installed on the z/OS host using SMP/E. You can then start to download an HCM install utility on your workstation. Proceed as follows:

1. The HCM install utility is available in the data set member SYS1.SEEQINST(EEQINSTX) on the z/OS host. Download the install utility in *binary* mode onto your workstation into a temporary directory. The file must be executable and have the extension EXE.

**Note:** If the product has been installed on your z/OS system in a different data set, ask your system administrator for its name and use this name for the download.

2. To install HCM, invoke the HCM install utility that now resides on your workstation. For example, choose the **Run** option in the **Start** menu. The installation starts.
3. Follow the steps through the installation. During the installation you are asked for the destination location of HCM and the configuration files. You can choose a new folder or select an existing one by clicking the **Browse** button.
4. Once the installation has successfully completed, HCM is installed on your system and you can delete the HCM install utility. It is not necessary to reboot your system. The HCM installation creates an entry in your **Start** menu from where you can launch HCM.

---

## Uninstalling HCM

Like most Windows applications, you can uninstall HCM using the standard Windows uninstall feature. Open the Control Panel by selecting **Settings** and then **Control Panel** from the **Start** menu.

For Windows 95, double-click the **Software** icon and choose the **Add/Remove software** tab sheet.

For Windows NT and Windows 2000, double-click the **Add/Remove programs** icon. Choose the **Hardware Configuration Manager** entry in the list box and start the uninstall process by clicking the **Add/Remove...** button or the **Change/Remove** button (for Windows 2000).

If for any reason the uninstall feature cannot delete all files, you are informed about that and have to remove these files or folders manually. Your configuration files are not deleted and you can keep them for later use.

**Note:** The EEQHCM.INI file is not deleted when you uninstall HCM. HCM uses the EEQHCM.INI file to store information and defaults across HCM sessions.

---

## Installing Service Levels

From time to time IBM makes available service levels to update HCM. Each service level contains the complete product and replaces prior HCM service levels.

During installation of the service level, the install utility informs you that HCM is already installed on your system. It is recommended to uninstall the old service level before installing the new one.

Always see the EEQREAD.ME file before using the new service level. It resides in the product directory after you have installed the new service level.

---

## Installing HCM in a LAN Environment

For shared access of HCM you can install HCM in a LAN environment. That has several advantages.

When you keep the HCM product directory on a LAN disk, all HCM users are using the same service level of HCM and a service update has only to be installed once.

Another possibility is to keep the HCM configuration files on a common LAN resource. This has the advantage, that the configuration data is accessible for different HCM users without the necessity of copying or transferring files. Remember the usual rules for multiple access of files in this content. Make sure that only one user has write access to the files at one time. HCM configuration files contain important data, therefore it is important to ensure, that these data do not get lost or damaged. In some cases it is easier to backup files from a LAN disk than to backup files from individual workstations.

When you run HCM in a LAN environment, consider the following:

- The installation utility of HCM creates an entry in the **Start** menu of the PWS from which HCM has been installed. If you want to use HCM from the LAN resource you must create an icon on your desktop to work with HCM.
- In case of a fatal error, or if some logging mechanism is activated for debugging purposes, HCM writes some log files to the product directory. If in your installation the HCM product directory on the LAN is write protected, the log files could not be created. In addition, if you want each LAN user to keep own log files, you can specify a directory other than the default one, using the ERRLOGDIR parameter in the [HCM] section of the EEQHCM.INI file. See "The HCMERR.LOG PWS File" on page 351 for more information on the error log file.
- As the install utility keeps some data locally on the workstation from which HCM is installed, it is recommend that the HCM program on the LAN is only deleted and updated by the PWS from which it has been installed originally.

---

## Establishing the Host Communication

After you have successfully installed HCM on your workstation, you have to make the definitions to link the host and the workstation. You can select from the following methods:

- "Alternative 1: Setting Up TCP/IP Definitions for z/OS"
- "Alternative 2: Setting up APPC Definitions for z/OS" on page 13

---

### Alternative 1: Setting Up TCP/IP Definitions for z/OS

When the HCM client is running on your workstation, it needs a server program running on the host. The server program is a TCP/IP program that listens for incoming HCM requests on a specific TCP/IP port. These HCM requests are passed to HCD to be executed. The server program - let it be named HCM agent - has to be started before HCM requests are passed. The HCM agent (HCD server) is started by a daemon program (HCM dispatcher) as soon as a HCM login request has been issued. This dispatcher program must be started before the first HCM login request is issued. It can run permanently on the z/OS host.

The following picture provides an overview of the structure and illustrates the relations between the HCM client, HCM dispatcher, and the HCM agent.

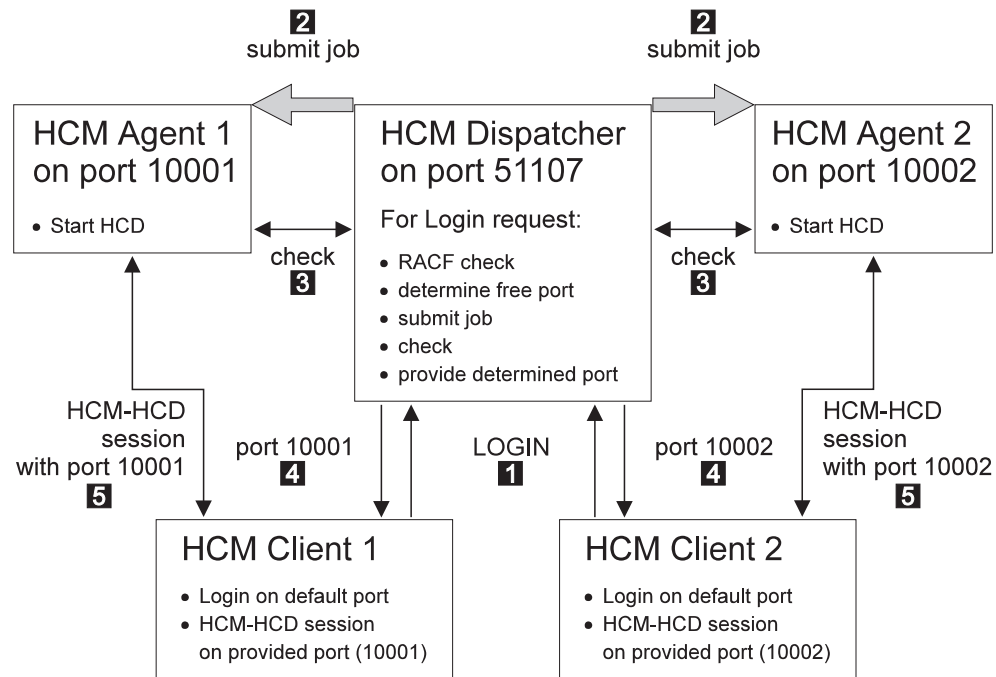


Figure 1. Relationship between HCM Client, HCM Dispatcher, and HCM Agent

The HCM dispatcher listens on a specific TCP/IP port and waits for incoming HCM login requests. For each HCM login request **1**, the dispatcher checks the passed userid and password for correctness. If userid and password are correct, the dispatcher looks for a free IP port. Then it starts an HCM agent program (HCD server program) which listens to HCM requests on that particular IP port **2**. As soon as the HCM agent is started and ready **3**, the dispatcher passes the particular IP port to the HCM client **4**. The HCM client then closes the session to the dispatcher and starts a session to the started HCM agent using the passed IP port **5**. When the HCM client has connected the HCM agent, the dispatcher is free again to wait for other incoming HCM login requests on its IP port. As soon as HCM terminates the HCM client server connection, the HCM agent will be terminated and the used port is freed again.

The advantage of having an HCM dispatcher which waits permanently on a specific port for incoming HCM login requests is, that each HCM user performs a login request to a fixed port id and does not have to specify a particular job input to start the HCD server. This means, that all HCM users automatically have the same setup, and that this has only to be done once. As the dispatcher is always running, all HCM users always use the same IP port for the login request. HCM saves the IP port across sessions and offers it in the login window. Therefore, the user has to specify it only once.

The TCP/IP port for the HCM login requests is determined when the HCM dispatcher is started. If during the start of the dispatcher nothing special is specified, the default TCP/IP port number is 51107. This is also the default port number which is used by HCM for a login request if no port is specified.

The HCM dispatcher creates a job out of a skeleton and submits this job to start the HCM agent (for an example of the job skeleton, see "Skeleton Used to Start the

HCM Agent”). After the HCM agent has been started and is running, the HCM client communicates with the HCM agent. The HCM client uses the same host name for the communication with the HCM agent as it has used for the login request to the HCM dispatcher. Therefore, the HCM agent must run on a system with the same host name as the HCM dispatcher. This fact might be especially important, if your system is within a parallel sysplex. In this case, you can specify the system on which the agent must run in the provided skeleton.

You can start the HCM dispatcher in two ways:

- Starting the dispatcher as a started task by using the procedure CBDQDISP provided in the library SYS1.PROCLIB. Consider to start the HCM dispatcher automatically after IPL of your z/OS system (for example, by using System Automation). See “Starting the HCM Dispatcher as a Started Task” on page 10 for an example on how to start the HCM dispatcher as a started task.
- Starting the dispatcher by submitting a batch job. A sample of a job, which can be used to start the dispatcher is provided as CBDQDISJ in ‘SYS1.SAMPLIB’. Please adapt this job, before you submit it.

If you do not want to accept the default port number, you can choose your own by changing the procedure or the sample job to start the dispatcher. Inform the HCM users of the TCP/IP port for the login requests. The HCM client will not accept a port number 0 or port numbers bigger than 65535.

Each HCM session needs its own dedicated server, and each active HCM server needs its own unique TCP/IP port number. The dispatcher looks for a free port number in a specific range. Per default a port number is chosen in the range of 10000 to 65535 for the server. It is possible to determine a different range for the ports to be chosen for the HCM agent during start of the dispatcher.

The userid under which the dispatcher is running, as well as the userids used for working with HCM must have permission to use UNIX System Services. Note that superuser authority is not required, but a home directory is to be provided for these userids. For example, you can use `/u/userid` (where *userid* is your own user ID) as a home directory for the HCM userid.

Depending on your general TCP/IP setup, it might be necessary that you include a DD statement for SYSTCPD for the HCM dispatcher and the HCM agent.

## Skeleton Used to Start the HCM Agent

There is a sample of skeleton CBDQAJSK provided in SYS1.PROCLIB. The HCM dispatcher uses this sample job to build up a job, which is submitted to start the HCM agent.

You can adapt this skeleton according to your installation needs. Especially you may want to specify accounting information in the job card of the skeleton, if your installation requires accounting information. Note, if your installation requires accounting information, and there is no accounting information specified in the skeleton, each HCM user will have to provide this information in the EEQHCM.INI file. For all other substitutable parameters, the HCM dispatcher provides default values, for example, `&SYSUID..HCD.PROFILE` and `&SYSUID..HCM.TRACE` as data set names for the HCD profile and the HCM trace data set. If you specify values for substitutable parameters, then these values will be used and not the default values or values specified in the HCM user’s EEQHCM.INI file, for example, an increased REGION size for the HCM agent.

In any case, check, whether you have to adapt this skeleton for your environment regarding the JOBPARM SYSAFF parameter for JES2 or MAIN SYSTEM parameter for JES3. The job must be executed on the system with the system name specified during HCM client logging to the HCM dispatcher.

Furthermore, an HCM user can take this skeleton, make a copy of it, and specify values for personal needs. To use this private copy, the HCM user needs an entry in the EEQHCM.INI file to tell the dispatcher not to use the default skeleton, but the user specified skeleton.

## Starting the HCM Dispatcher as a Started Task

There is a procedure CBDQDISP provided in SYS1.PROCLIB, which you can use to start the HCM dispatcher as a started task.

You can create a new userid or use an existing one to be associated with the task of the dispatcher. This userid has to have permission to use UNIX System Services.

After the procedure has been adapted to your installation needs, you can start it by using the start command. Start the HCM dispatcher always after the system has been IPLed. You can also start the dispatcher automatically using System Automation.

You can change the following parameters in the procedure:

### Job name

The HCM dispatcher submits a job for each incoming HCM login request. Per default the job name of this job starts with CBD. If you want the job names to start with something different than CBD, you can specify a different string for the beginning of the job name by setting the JNP variable. If you want the job name to contain the userid of the HCM user, specify +U and the dispatcher will substitute the +U with the requester's userid. You can also add a prefix to the userid or append a string to the userid. For example, a X+UY for a passed userid BMGN would result in XBMGNY for the beginning of the job name. Note, the dispatcher does not accept more than 7 digits for the beginning of a job name. Strings longer than 7 digits are truncated. The dispatcher generates a job name using the JNP variable and fills it up to 8 digits. If the JNP variable contains 3 digits, the job name is filled up to 8 digits by using parts of the port address of the dispatcher and parts of the port address of the HCM client, which will be started. If the JNP variable does not have 3 digits, it will be filled up to 8 digits by using 0...9 and A...Z.

### Logging information

For special cases (debugging or better control), the dispatcher can write logging information into a data set. In this case, change the LOG variable.

**Port** If there is any reason to use another port than 51107 on which the dispatcher listens for incoming HCM login requests, you can specify your port by setting the PORT variable.

### Skeleton

You can specify another skeleton to be used to start the HCM agent by changing the JSK variable.

### Port range

You can use a different range of ports, in which the dispatcher will

determine a free port to be used by the HCM agent. Set the variables P0 and P1 to appropriate values. Note, ports bigger than 65535 are not allowed.

## Creating a Userid

If you want to run the dispatcher as a started task, you must create a userid for it.

1. Create a userid to be used as started task for the procedure CBDQDISP. This userid must have permission for running UNIX System Services.
2. Define the userid to be used for the started task procedure CBDQDISP.
3. Refresh RACF.

The following figure shows a sample job in which the userid for the HCM dispatcher can also be used by the UNIX System Services. (Note that the specified home directory for the dispatcher is the root directory in this example).

```
//ADDUSER EXEC PGM=IKJEFT01
...
//SYSIN DD *
AU CBDQDISP NAME('STARTED-T. M. GNIRSS') OWNER(STCGROUP) +
DFTLGRP(STCGROUP) +
OMVS(HOME(/) PROGRAM(/bin/sh) UID(4711))
/*
//DEFRACF EXEC PGM=IKJEFT01
...
//SYSTSIN DD *
RDEF STARTED CBDQDISP.* STDATA(USER(CBDQDISP) GROUP(STCGROUP))
/*
//REFRESH EXEC PGM=IKJEFT01
...
//SYSTSIN DD *
SETR REFRESH RACLIST(STARTED) GENCMD(*) GENERIC(*)
/*
```

Figure 2. Sample JCL for Creating a Userid for UNIX System Services

## Starting the HCM Dispatcher as a Batch Job

You can either start the dispatcher as a started task, or by submitting a batch job. For this purpose, you can use the sample job CBDQDISJ in SYS1.SAMPLIB and submit it after you have adapted it to your needs.

## Stopping the Dispatcher

To stop the HCM dispatcher, use the **cancel** command. The **stop** command is not supported.

## Define HCD Profile

HCM uses HCD on the host as its server. This allows you to define an HCD profile to tailor HCD supplied defaults and processing options to your installation needs. Using a profile is optional. The profile file data set must have the following characteristics:

- Be either a sequential or a member of a partitioned data set
- Have fixed length (80 bytes), fixed blocked record format

For more information, see *z/OS HCD User's Guide*.

**Note:** If you do not need an HCD profile, remove the substitutable variable <HCDPROF> from the skeleton, which is used to start the HCM agent.

## Allocate the HCM Trace Data Set

Before you can start an HCM agent (HCD server) on the host, you have to allocate a data set that will be used by this HCM agent's trace facility. This trace data set must have a different name than the standard HCD trace data set (which is called *userid.HCD.TRACE*), allowing you to use HCM and HCD concurrently. The recommended name for the HCM agent's trace data set is *userid.HCM.TRACE*.

The following job can be used to allocate the trace data set.

```
//ALLOC JOB (DE03141,,),'GNIRSS',CLASS=A,MSGCLASS=H,MSGLEVEL=(1,1)
//*
//STEP1 EXEC PGM=IEFBR14
//DUMMY DD DSN=WAS.HCM.TRACE,
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=6160),
// SPACE=(CYL,(5,20)),DISP=(NEW,CATLG),UNIT=SYSALLDA
//
```

Figure 3. Sample Job for Trace Data Set Allocation

## Specifying TCP/IP on Your Workstation

Before you can use HCM with TCP/IP, the TCP/IP networking protocol must be installed and configured on your workstation. See your TCP/IP documentation for information on how to do that.

Furthermore, see the HCM User's Guide update for service level 7 on the HCM home page for an example on how to configure TCP/IP on your workstation. See <http://www.ibm.com/servers/eserver/zseries/zos/hcm>, click on **Product Updates**, select the **HCM Documentation**, and view the User's Guide updates for **OS/390 2.9.0 HCM (TCP/IP Support)**. The update is available in PDF format. You can view it with the Adobe Acrobat Reader.

## Verifying Host Communication

If you cannot establish a connection to the host you should first check, whether you specified the correct host name in the HCM login dialog. If the host name is correct, use the **ping** command to check your connection. In a command prompt window, enter the following command:

```
ping <hostname>
```

where <hostname> is your HCM host name.

If the ping command reports an error, make sure you can reach your TCP/IP name server. Enter the following command:

```
ping <nameserver>
```

where <nameserver> is your name server's IP address in dotted-decimal notation (for example, 9.164.182.32).

If this ping command also reports an error, make sure that you specified the correct IP address for the name server (provided by your network administrator) in your Windows TCP/IP configuration notebook. If you specified the name server IP address correctly, contact your network administrator to verify that all your TCP/IP configuration parameters are correct (router IP address, subnet mask, your workstation's IP address).

## Problem Determination

HCM displays error messages if the TCP/IP connection fails. For information on error messages, see Appendix A, “HCM Messages” on page 355. You may also check for documentation updates in *HCM Documentation* under *Product Updates* provided on the HCM home page in the Internet (<http://www.ibm.com/servers/eserver/zseries/zos/hcm>).

If you get messages that are not listed in Appendix A, “HCM Messages” on page 355, inform IBM and provide the complete and exact message text (especially the internal description and the error stack information). If possible, make a screen shot of the message and provide information about the circumstances that caused the message to occur.

---

## Alternative 2: Setting up APPC Definitions for z/OS

This chapter describes how to make your APPC definitions on the host and your workstation.

Setting up APPC requires updates at each target host, at the controller being used for the communication, and at the workstation on which the workstation feature is running. These tasks and how to verify a setup are described in the following sections by means of the example shown below. (The workstation is configured as an independent LU.)

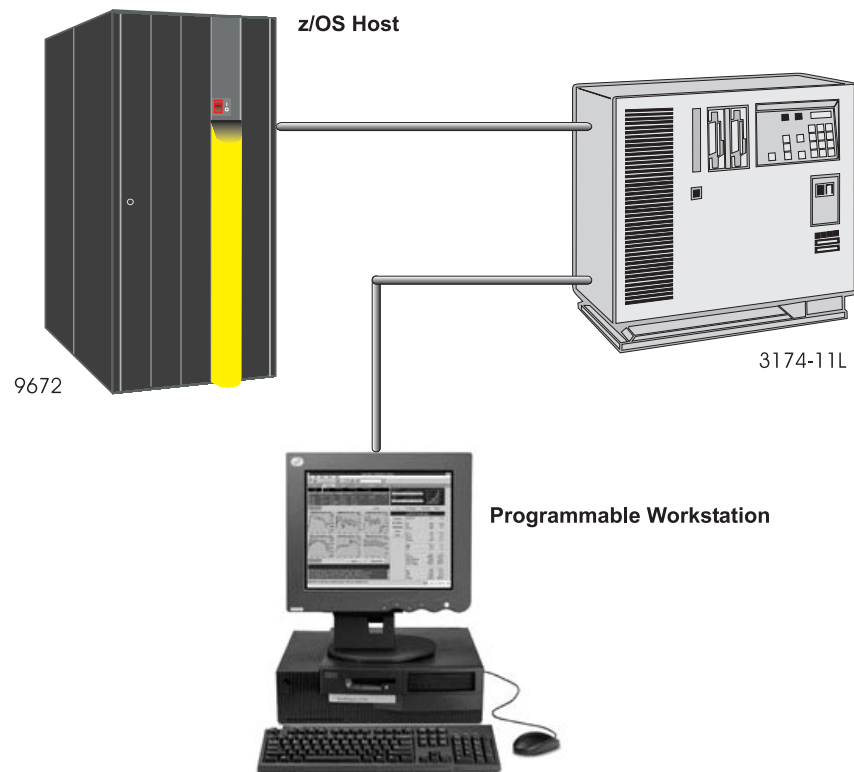


Figure 4. Example of a Setup with a z/OS Host, a PWS, and a Controller

## APPC Setup Values You Need to Enter and Where

The data values used in the example are listed sequentially below. These values are identified by digits and letters. The letters indicate where to enter the value: at the **H** = host, **C** = controller, and **W** = workstation.

Where	Value	Description
<b>1H</b>	SYS1.APPCTP	The VSAM file containing the TP profiles that will be referenced by APPC to start the host transaction program (TP).
<b>2HW</b>	EEQTPA00	The name of the transaction program. This value is sent from the workstation to the host, at the time a conversation is allocated, to tell APPC which TP profile entry is to be used to initialize the host transaction program.
<b>3H</b>	HCM	The class of transaction initiator that will run the host TP to define job scheduling and job performance characteristics.  (The name you choose must also be defined in SYS1.PARMLIB(ASCHPMxx))
<b>4H</b>	IPPAPPC	The VTAM mode table that contains - in our example - #INTER.
<b>5W</b>	MVSSYSTM	The symbolic destination name (SDN) given to the host system. This name must be specified on the <b>Login</b> window in order to setup a communication link with the host. This value relates the host name known to you to a partner LU, Mode Name (VTAM), and TP Name (APPC). You must use capital letters for the SDN.
<b>6HW</b>	IPSA7APC	An ACB name of the host that is used as the partner LU to establish the session with the workstation. (You can also define an alias.)
<b>7HW</b>	#INTER	The mode name, or logmode, that is an entry in the VTAM mode table, which is listed as Number 1. A network node server, as in this example, will route APPC requests to the target system; therefore, connections and partner LU location definitions need not be performed.
<b>8HW</b>	FDJ81006	Both the control point (CP) name of this workstation and the name of the independent LU that will establish a session with the host.  (You can also define an alias.)
<b>9HW</b>	DEIBMIPS	The ID of this network. You can find the NETID in the VTAM start options list. Look in your file ATCSTRxx, where xx is installation-dependent.
<b>10CW</b>	4000 1000 0001 04	The LAN destination address of the token-ring adapter in the network's communication controller, including the 2-character service access point (SAP) ID of 4.

## APPC Enablement on the Host

You need to make APPC definition on your host. See the following publications for information about creating an APPC environment in your installation.

- *z/OS MVS Planning: APPC/MVS Management*, SA22-7599
- *z/OS MVS Programming: Writing Transaction Programs for APPC/MVS*, SA22-7621

### Step One: Define TP Profile

The first step in the process of setting up the APPC communication is to define an APPC TP profile. This TP profile contains JCL statements that call a job to initialize HCM. ATBSDFMU is the APPC administration utility program.

```

//userjob JOB (account),'info',MSGCLASS=A,MSGLEVEL=(1,1),
//          NOTIFY=user,REGION=7000K,CLASS=A
//*****
/* This job adds the TP profile EEQTPA00 used by HCM 2.7.0 *
/* to the profile data set SYS1.APPCTP. *
//*****
/* LICENSED MATERIALS - PROPERTY OF IBM *
/* 5647 - A01 *
/* (C) COPYRIGHT IBM CORP. 1999 *
/* STATUS = XXXXXX *
//*****
//STEP EXEC PGM=ATBDFMU
//SYSPRINT DD SYSOUT=*
//SYSSDLIB DD DSN=SYS1.APPCTP,DISP=SHR 1H
//SYSSDOUT DD SYSOUT=*
//SYSIN DD DATA,DLM=XX
        TPADD
            TPNAME(EEQTPA00) 2HW
            SYSTEM
            ACTIVE(YES)
            TPSCHED_DELIMITER(##)
            TAILOR_SYSOUT(NO)
            TAILOR_ACCOUNT(NO)
            CLASS(HCM) 3H
            TPSCHED_TYPE(STANDARD)
            JCL_DELIMITER(END_OF_JCL)
//EEQTPA00 JOB MSGLEVEL=(1,1),MSGCLASS=0,REGION=128M see note 1
//HCMA00 EXEC PGM=CBDAQSRV,TIME=NOLIMIT
//STEPLIB DD DISP=SHR,DSN=SYS1.SCBDHENU see note 2
//CEEDUMP DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSTEM DD SYSOUT=*
//HCDPROF DD DISP=SHR,DSN=&SYSUID..HCD.PROFILE see note 3
//HCDTRACE DD DISP=SHR,DSN=&SYSUID..HCM.TRACE see note 4
END_OF_JCL
KEEP_MESSAGE_LOG(ERROR)
DATASET_STATUS(NEW)
MESSAGE_DATA_SET(&SYSUID.&SYSUID.&TPDATE.&TPTIME.JOBLOG)
##
XX
/*

```

Figure 5. APPC Transaction Profile - EEQTPA00

This sample job is shipped with the product in SYS1.SEEQINST member EEQTPA00.

#### Notes:

1. The value used for the region depends on your needs. If you use a value that is too small, you can run out of storage (HCD messages CBDA056I or CBDA474I will be issued to inform about this condition).
2. SYS1.SCBDHENU contains HCD messages which are also displayed in HCM. However, if you have decided for your installation that this library was moved into another library (for a faster access of the messages), you have to adapt the STEPLIB to your needs.
3. This is the HCD profile. See “Step Four: Define HCD Profile” on page 16 for more details.
4. This is the trace data set needed when tracing HCD activities. See “Step Five: Allocate the HCD Trace Data Set” on page 16 for more details. Note that the data set needs to be in read/write access mode.

## Step Two: Define in SYS1.PARMLIB(APPCPMxx)

In the second step you define the host LU to which the workstation (HCM) establishes a session. In addition, you define the data set where you can find the TP profile used to establish a communication.

Sample output is shown below for our example—SYS1.PARMLIB(APPCPM00).

SYS1.PARMLIB(APPCPM00) - DEFINES TO MVS/APPC, THE LOCAL LU THAT  
HCM WILL TALK TO.

```
LUADD ACBNAME(IPSA7APC),           6HW
      SCHED(ASCH),
      TPDATA(SYS1.APPCTP),          1H
      TPLEVEL(USER)
```

## Step Three: Define in SYS1.PARMLIB(ASCHPMxx)

The next step is to tell the APPC translation scheduler the scheduling characteristics of the transaction program on the host that will communicate with the workstation.

Sample output is shown below for our example—SYS1.PARMLIB(ASCHPM00).

SYS1.PARMLIB(ASCHPM00) - DEFINES TO THE APPC/MVS TRANSACTION  
SCHEDULER, THE CHARACTERISTICS OF THE  
TRANSACTION PROGRAM ON THE HOST THAT  
WILL BE IN CONVERSATION WITH HCM.

```
CLASSADD CLASSNAME(HCM),           3H
      MAX(10),
      MIN(2),
      RESPGOAL(0.02),
      MSGLIMIT(500)
OPTIONS DEFAULT(HCM),              3H
      SUBSYS(JES2)
TPDEFAULT REGION(4M),
      TIME(1440),
      MSGLEVEL(1,1),
      OUTCLASS(A)
```

## Step Four: Define HCD Profile

HCM uses HCD on the host as its server. This allows you to define an HCD profile to tailor HCD supplied defaults and processing options to your installation needs. Using a profile is optional. The profile file data set must have the following characteristics:

- Be either a sequential or a member of a partitioned data set
- Have fixed length (80 bytes), fixed blocked record format

For more information, see *z/OS HCD User's Guide*.

**Note:** If you do not need an HCD profile, remove the HCDPROF DD statement from the EEQTPA00 TP profile.

## Step Five: Allocate the HCD Trace Data Set

Before you can start an HCD server on the host, you have to allocate a data set that will be used by the HCD trace facility. This trace data set must have a different name than the standard HCD trace data set, allowing you to use HCM and HCD concurrently. The recommended name is userid.HCM.TRACE.

If you decide to use another name for the trace data set, you must change the EEQTPA00 TP profile accordingly.

The following job can be used to allocate the trace data set.

```
//ALLOC JOB (DE03141,,),'GNIRSS',CLASS=A,MSGCLASS=H,MSGLEVEL=(1,1)
//*
//STEP1 EXEC PGM=IEFBR14
//DUMMY DD DSN=WAS.HCM.TRACE,
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=6160),
// SPACE=(CYL,(5,20)),DISP=(NEW,CATLG),UNIT=SYSALLDA
//
```

Figure 6. Sample Job for Trace Data Set Allocation

## Step Six: Make the Necessary VTAM Definitions

The following VTAM definitions are required in order to establish an HCM connection to HCM on the host using an APPC communication link.

1. Specify an application program major node to define the host LU to VTAM.
2. Specify a local SNA major node to define the 3174 and the workstation to VTAM.
3. Optionally you may define a mode table with the appropriate log mode entry, if you are not using either #BATCH or #INTER. Assemble and link this mode table into your load module library.

**Define the host LU to VTAM:** Define an application major node for the host LU that will be in session with HCM. The numbers are explained in “APPC Setup Values You Need to Enter and Where” on page 14.

```
A7APPC VBUILD TYPE=APPL                APPL MAJOR NODE FOR APPC
IPSA7APC APPL ACBNAME=IPSA7APC,          6HW
        APPC=YES,
        AUTOSSES=0,
        DDRAINL=NALLOW,
        DRESPL=NALLOW,
        EAS=20,
        MODETAB=IPPAPPC,                 4H
        DLOGMOD=#INTER,                  7HW
        PARSESS=YES,
        SECACPT=CONV,
        SRBEXIT=YES,
        VERIFY=NONE,
        VPACING=2
```

**Define local SNA major node for controller and workstation:** In the example, a 3174 establishment controller is used. The sample output is shown below. The numbers are explained in “APPC Setup Values You Need to Enter and Where” on page 14.

```
LOCAL SNA MAJOR NODE FOR THE 3174 & LAN-ATTACHED WORKSTATION

IPPLAN04 VBUILD TYPE=LOCAL
*
LOCAL500 PU CUADDR=500,PUTYPE=2,MAXBFRU=12,ISTATUS=ACTIVE,
SSCPFM=USSSCS,VPACING=0,XID=YES
* INDEPENDENT LUS
FDJ81006 LU LOCADDR=0,DLOGMOD=#INTER,MODETAB=IPPAPPC 8HW 7HW 4H
* DOWNSTREAM PU FOR 3270 SESSIONS
PU504 PU CUADDR=504,PUTYPE=2,MAXBFRU=12,ISTATUS=ACTIVE,
DLOGMOD=ESAAPPC,MODETAB=OS2VM,
PACING=1,SSCPFM=USSSCS,VPACING=1
LOLN5041 LU LOCADDR=2,DLOGMOD=SNX32702,MODETAB=ISTINCLM,
USSTAB=USSIPLA
```

## Security Information

To use HCM, you must have a user ID and password defined to the host security software (for example RACF).

Furthermore, since HCM automatically accesses SYS1.NUCLEUS you need read access permission for SYS1.NUCLEUS.

## Planning APPC Enablement on the Workstation

HCM uses a LU 6.2 type communication link to HCM on the host. The LU (logical unit) is accessed via the Common Programming Interface - Communications (CPI-C) application interface. This section describes the steps needed to create a communication link.

SNA provides great flexibility in defining the layout of the network. It is possible to configure your workstation as Type 2.1 node, attaching directly to an SNA subarea. It is also possible to incorporate a workstation as an APPN network node. This chapter does not cover all possible configurations, it shows only one example out of several configuration possibilities.

You have to enter some information such as the LU name or TP profile name in different places. Using different values will result in a non-operational link. Before starting your actual configuration, you should collect all information needed at a later stage. Make sure you find proper answers to the following questions before continuing.

- What is the name of the LU to be used by the HCM server side of the host? Ask your SNA network administrator for the name of the LU. It has to be an LU 6.2 type. This will be used in the workstation, APPC and VTAM definition. It will be referred to as the host LU in this chapter.
- What is the name of the network, the host LU belongs to? Remember, that a fully qualified destination name consists of the network name and the LU name.
- Agree on the name of the transaction program (TP) registered with APPC on the host. Ask your system administrator responsible for the host system for a valid name. The proposed name is EEQTPA00.
- What is the name of the LU to be used on the workstation? It is usually the same name as the local node name. Note, Local node names are also referred to as CP or PU name. Unless you use VTAM 4.1 or higher, this name must be defined in VTAM as an independent LU (LOGMODE=0). This name will be referred to a local LU name in this chapter.
- What is the mode name to classify the transport characteristics? This name must be a name supported by the mode table which serves your local LU name. Check with your SNA networking specialist, and ask which modes are supported with regard to your local LU.
- What is the Token-Ring address of the boundary node communicating to the SNA subarea network? If you have already defined 3270 sessions via a Token-ring connection, make sure to use the same link for the APPC connections.

## Defining APPC on Your Workstation

After you have installed IBM Personal Communications on your workstation you can start to make your APPC definitions.

1. Select **SNA Node Operations** that you find in the **Start** menu in **Personal Communications** under **Administrative and PD Aids**.

2. In the **SNA Node Operations** dialog, select **SNA Node Configuration** under the **Launch** menu. In this dialog, you will have to select several configuration options.

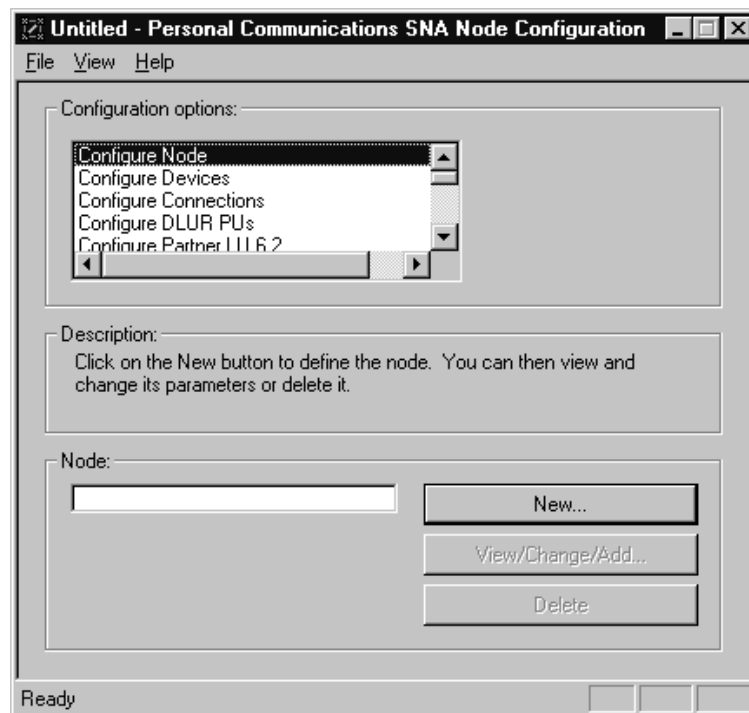
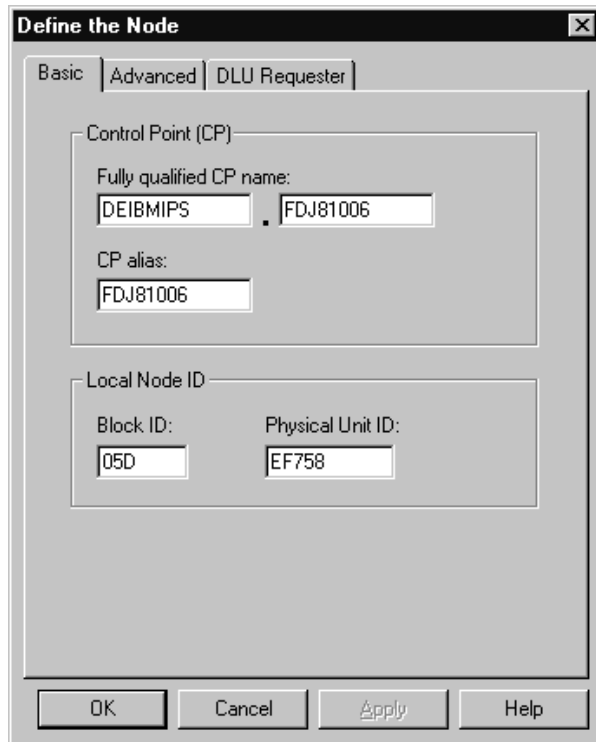


Figure 7. SNA Node Configuration

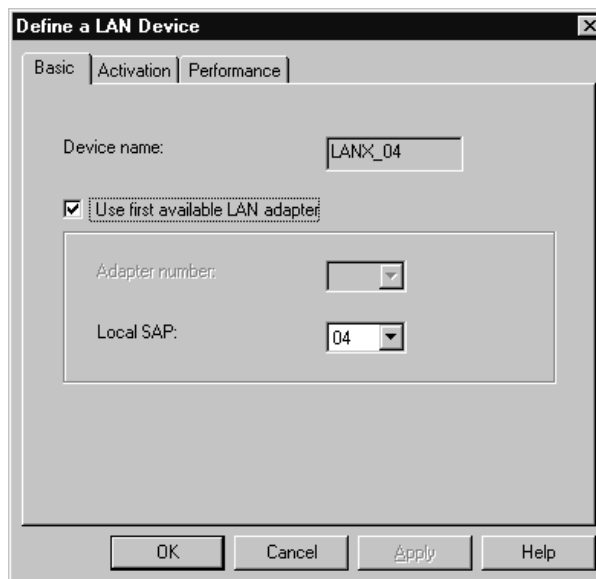
3. First, select **Configure Node** and press the **New** button.
  - a. The **Define the Node** dialog appears. Fill in the **Fully qualified CP name** that consists of the network ID and the LU name of the workstation. You also have to specify a CP alias and the local node ID. Then select **OK**.



The **Define the Node** dialog box has three tabs: **Basic**, **Advanced**, and **DLU Requester**. The **Basic** tab is active. It contains two main sections. The first section, **Control Point (CP)**, has a label **Fully qualified CP name:** followed by two text boxes containing **DEIBMIPS** and **FDJ81006**, separated by a period. Below this is a label **CP alias:** followed by a text box containing **FDJ81006**. The second section, **Local Node ID**, has two labels: **Block ID:** followed by a text box containing **05D**, and **Physical Unit ID:** followed by a text box containing **EF758**. At the bottom are four buttons: **OK**, **Cancel**, **Apply**, and **Help**.

Figure 8. Define the Node

4. Back in the **SNA Node Configuration** dialog, select **Configure Devices**. The DLC type in this sample is LAN. Press the **New** button.
  - a. The **Define a LAN device** dialog appears. You can accept the offered values and press **OK**.



The **Define a LAN Device** dialog box has three tabs: **Basic**, **Activation**, and **Performance**. The **Basic** tab is active. It contains a label **Device name:** followed by a text box containing **LANX\_04**. Below this is a checked checkbox labeled **Use first available LAN adapter**. Underneath the checkbox is a group box containing two labels: **Adapter number:** followed by a dropdown menu, and **Local SAP:** followed by a dropdown menu containing the value **04**. At the bottom are four buttons: **OK**, **Cancel**, **Apply**, and **Help**.

Figure 9. Define a LAN Device

5. Back in the **SNA Node Configuration** dialog, select **Configure Connections** and press the **New** button.

- a. The **Define a LAN Connection** dialog appears. Fill in the destination address.

The dialog box is titled "Define a LAN Connection" and has three tabs: "Basic", "Advanced", and "Adjacent Node". The "Basic" tab is selected. It contains the following fields and controls:

- Link station name:** A text box containing "LINK0000".
- Device name:** A dropdown menu showing "LANX\_04".
- Discover network addresses...:** A button.
- Destination address:** A text box containing "400010000001".
- Remote SAP:** A dropdown menu showing "04".
- Token-Ring:** A radio button that is selected.
- Ethernet:** A radio button that is not selected.
- Buttons:** "OK", "Cancel", "Apply", and "Help" at the bottom.

Figure 10. Define a LAN Connection

- b. Check the **Advanced** page of this dialog.

The dialog box is titled "Define a LAN Connection" and has three tabs: "Basic", "Advanced", and "Adjacent Node". The "Advanced" tab is selected. It contains the following fields and controls:

- Activate link at start:** A checked checkbox.
- HPR support:** An unchecked checkbox.
- APPN support:** A checked checkbox.
- Auto-activate support:** An unchecked checkbox.
- Link to preferred NN server:** An unchecked checkbox.
- Solicit SSCP sessions:** An unchecked checkbox.
- PU name:** A text box.
- Maximum PIU size:** A text box containing "32767".
- Local Node ID:** A section containing two text boxes:
  - Block ID:** A text box containing "05D".
  - Physical Unit ID:** A text box containing "EF758".
- Buttons:** "OK", "Cancel", "Apply", and "Help" at the bottom.

Figure 11. Define a LAN Connection, Advanced

- c. Select the **Adjacent Node** page of this dialog. Fill in the **Adjacent CP name** and select your **Adjacent CP type**. Press **OK**.

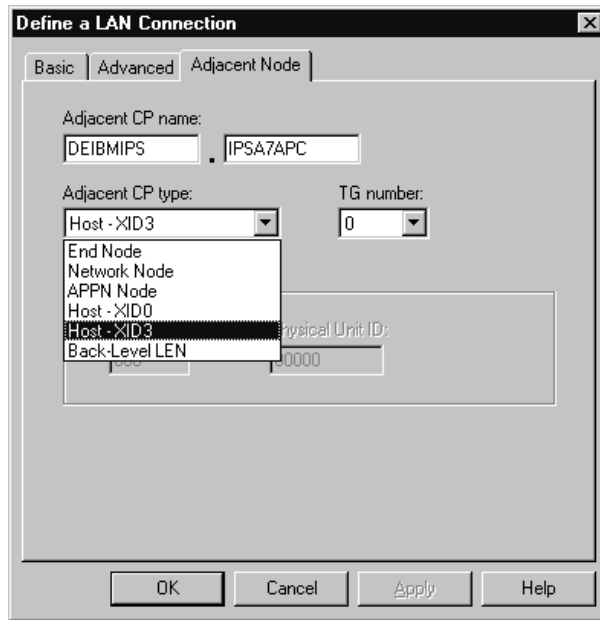


Figure 12. Define a LAN Connection, Adjacent Node

6. Back in the **SNA Node Configuration** dialog, select **Configure Partner LU 6.2** and press the **New** button.
  - a. The **Define a Partner LU** dialog appears. Fill in the partner LU name and an alias to which HCM has to establish a connection. Select also the CP name.

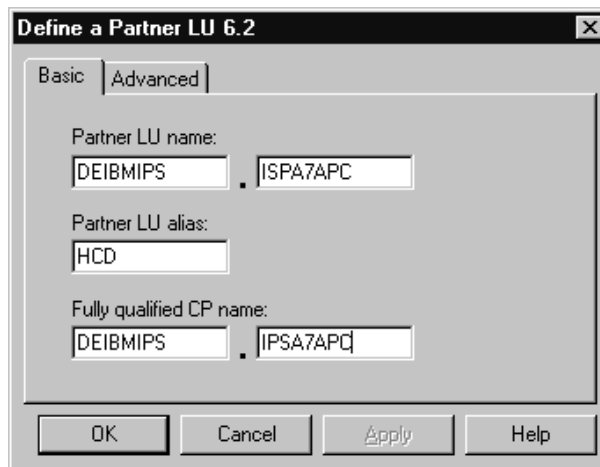


Figure 13. Define a Partner LU

- b. Check the **Advanced** page of this dialog. You can accept the offered values and press **OK**.



Figure 14. Define a Partner LU, Advanced

7. Back in the **SNA Node Configuration** dialog, select **Configure CPI-C Side Information** and press the **New** button.
  - a. The **Define CPI-C Side Information** dialog appears. Specify a **Symbolic destination name** of your choice. You will have to enter this name in the Login dialog of HCM to establish a host connection. By using this name, APPC knows to which host (**Partner LU**) a connection must be established, which **node** must be used, and which **TP profile** must be executed on the host.

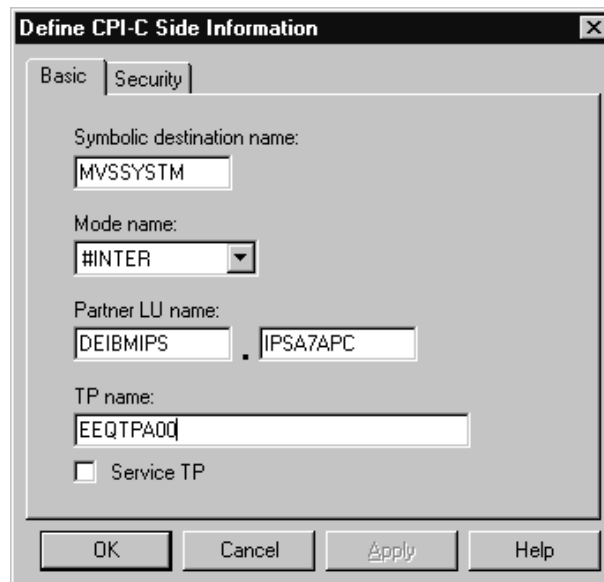


Figure 15. Define CPI-C Side Information

- b. Check the **Security** page of this dialog. You can accept the offered values and press **OK**.
8. Back in the **SNA Node Configuration** dialog, you have to save the definitions you have made. Select **Save** under the **File** menu.
9. The **Save as** dialog appears. Specify a file name. You have to open this file again when you start APPC. After saving the file, confirm that this configuration is set to be the default one.

Exit to the **SNA Node Operation** dialog. You have made all definitions but should check them now.

## Checking Your APPC Definitions

The following procedure describes how to check your APPC definitions.

1. After you have saved your definition you are back in the **SNA Node Operation** dialog. Press the green button in the upper left corner or select **Start mode** under the **Operations** menu. The **Open** dialog appears.

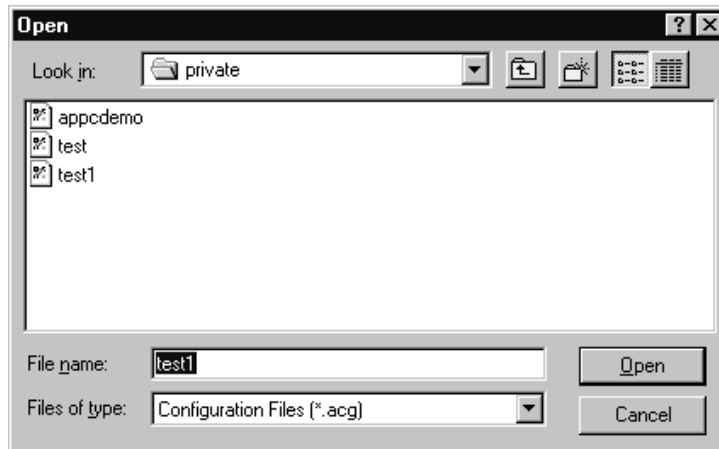


Figure 16. Open

2. Select your configuration file and open it. The **Personal Communications SNA Node Operations** dialog appears. In this dialog you can check whether your link is in active state. Specify **Connections** in the prompt of the title bar.

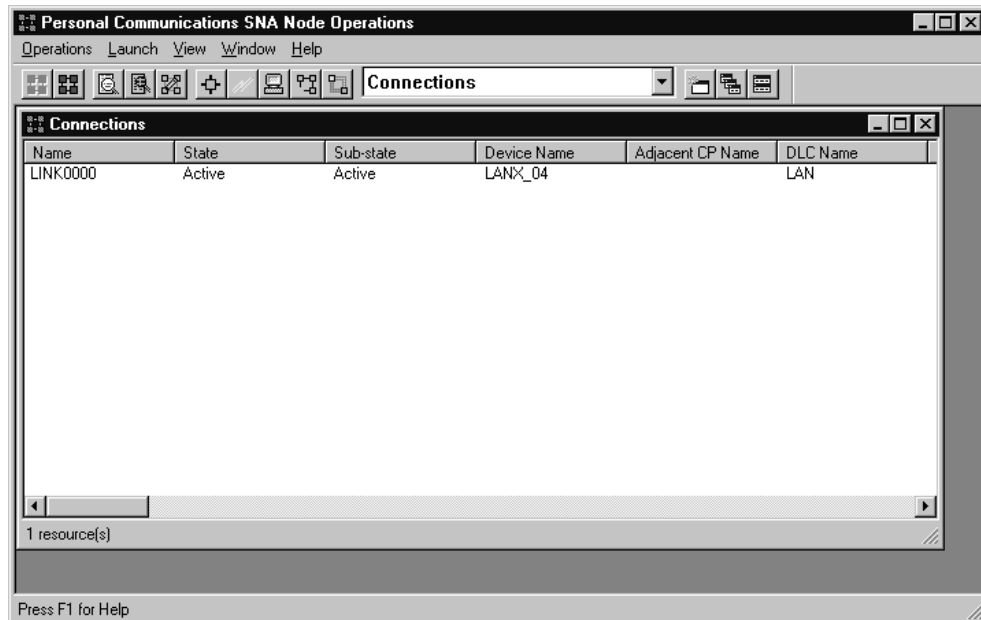
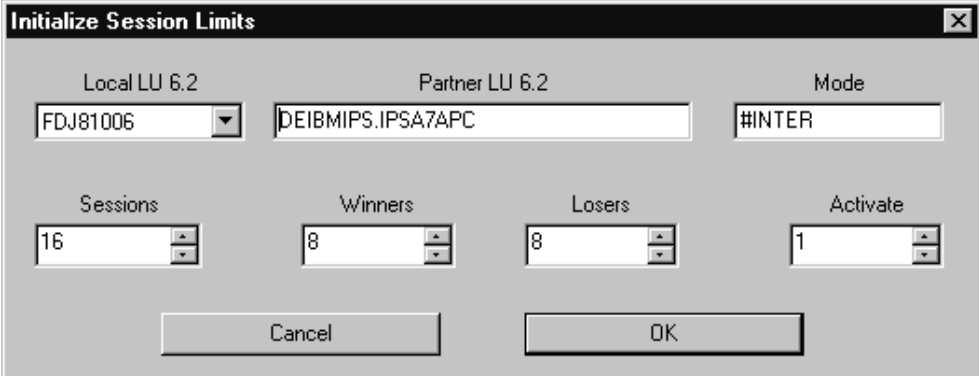


Figure 17. Personal Communications SNA Node Operations

3. To check whether sessions could be established, specify LU6.2 sessions in the prompt of the title bar and select **CNOS Initialize** under the **Operations** menu. Press **OK**.



The dialog box titled "Initialize Session Limits" contains the following fields and controls:

Local LU 6.2	Partner LU 6.2	Mode
FDJ81006	DEIBMIPS.IPSA7APC	#INTER

Sessions	Winners	Losers	Activate
16	8	8	1

At the bottom are "Cancel" and "OK" buttons.

Figure 18. Initialize Sessions Limit

4. Back in the **Personal Communications SNA Node Operations** dialog select **Refresh** under **View** to show the LU 6.2 sessions.
5. If you do not get a successful connection to the host you can check for an explanation by selecting **Display SNA Sense Data** under **Administration and PD Aids**.

You can also use the APING utility to verify that all definitions in the network have been defined correctly. Select **Check Connection APING** under **Personal Communications / Utilities / APPC and CPIC utilities**. Note that you have to install some support on the host system before you can use APING successfully. See the respective product documentation for more details.

## Starting APPC

Before you can invoke HCM you have to start APPC. A simple way to start APPC is to create a short-cut for this action. Invoke the CSSTART.EXE of Personal Communication. See the Windows documentation for information on how to create a short-cut.



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## Chapter 3. Getting Started

This chapter explains how to use the HCM user interface: keyboard, mouse, configuration diagram, objects, menus, dialogs, and reports. You can tailor your view of the configuration diagram by showing or hiding selected objects; you can also zoom, scroll, and set viewing preferences or options. You can locate, order, create, delete or edit selected objects in the diagram, using menu commands and dialog options. You can also specify and print wall charts or reports.

Once you are familiar with the HCM user interface, you can start building hardware configurations for your system (see Chapter 4, “Building Your Configuration” on page 49).

---

### Starting and Stopping HCM

Before invoking HCM, make sure that your APPC or TCP/IP connection to the HCD server on the host is running. Refer to Starting APPC on page 25 or “Alternative 1: Setting Up TCP/IP Definitions for z/OS” on page 7. Then start HCM. This can be done either by starting the executable or by double-clicking with the left mouse button on an HCM configuration file in Windows Explorer. In the latter case, the configuration is loaded as soon as HCM is running. The Product Information window of the Hardware Configuration Manager (HCM) program is displayed.

Click on **OK** and the **Login** dialog will appear.

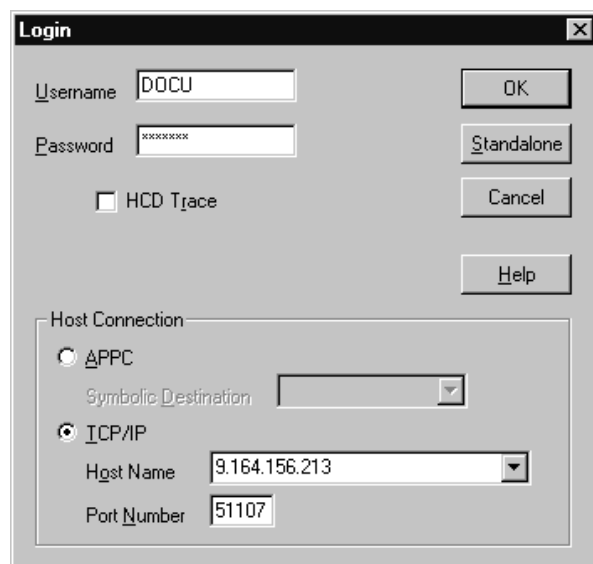


Figure 19. Login Dialog

If this is the first time you have started HCM after installing it, you must enter your user name and password and select either to use APPC or TCP/IP. If you use APPC, you have to enter the symbolic destination name for the host system. If you use TCP/IP, you have to enter a host name and a port number. The default port

number is 51107. If your TCP/IP connection uses another port number, ask your system administrator for the right number.

HCM will save the entered values in the EEQHCM.INI file, so that when you log in subsequently, you will only have to enter your password. HCM uses the EEQHCM.INI file to store information and defaults across the HCM sessions. This ini file is created *after* the first successful HCM session. It is located in the Windows system directory.

If the host machine accepts the given user name and password, the **Login** dialog disappears and you can begin your HCM session. Otherwise, a message appears, notifying you of login failure. Choosing **Cancel** will terminate HCM.

If the login fails due to an expired password, you must logon to the host via your terminal session (for example, the 3270 Emulator) to change your password. You cannot change the password in your HCM session.

If you expect an error during login, you can also click in the **HCD Trace** check box in the **Login** dialog to enable the HCD facility on the host, which traces all activity during the HCM session. Alternatively, during the session you can activate (or deactivate) the trace by toggling the **Activate HCD Trace** command in the **Options** menu. The HCD Trace is normally used only for troubleshooting HCM system problems; see “Using the HCD Trace Facility” on page 351 for details on how to configure the host to properly store the trace information.

---

## Working with the User Interface

This chapter describes how you can interact with the HCM user interface.

### Keyboard

Use the function keys and special keys as shortcuts for commands. HCM employs the following keyboard conventions:

- F1** Opens the **Help** dialog.
- F2** Shortcut for the **Fit to Window** command, which scales the diagram to completely fit in the display window.
- F3** Shortcut for the most recently used named view. When selected, the last view you saved with the **Save Named View** from the **View** menu is displayed as configuration diagram.
- F4** Shortcut for **Highlighted Objects** on the **View** menu. Displays only those objects selected (highlighted) in the current view and those objects connected to them, resulting in a *cropped view*.
- F5** Opens the **Assign Cable** dialog for the connection on the selected interface. Note that the interface at the lower end of the connection must be selected.
- F8** Shortcut for the **Locate Selected Object** command. This command scrolls the most recently selected object into view – useful after creating an object.
- F9** Opens the **Edit** dialog for the currently selected object.

#### PAGE UP/DOWN

Scrolls the diagram up or down a screen at a time. Can move the display to the left half a screen at a time with CTRL+PAGE UP, or to the right with CTRL+PAGE DOWN.

**HOME**

Zooms out.

**CTRL+HOME**

Zooms out all the way to **Fit to Window** (same as F2).

**END**    Zooms in.**CTRL+END**

Zooms in all the way to **Actual Size**, which scales the diagram so that objects are viewed at their approximate size when a diagram is printed at full size.

**ALT+BACKSPACE**

Shortcut for **Undo** most recent action.

**DEL**

Shortcut for **Delete** selected object. If the selected object is a connected channel interface or a switch port connected to a CHPID, the interface will be disconnected.

## Mouse

The mouse can be used to interact with the diagram in the following ways.

**Click left button**

Selects the object under the mouse cursor and deselects all other selected objects. In addition, all connections to the object are highlighted.

Holding CTRL while clicking selects or deselects the object under the cursor without deselecting other objects. This is used to select multiple objects.

Holding SHIFT while clicking selects the object under the mouse cursor and displays only those cables connected to the selected object.

**Note:** Click again without holding SHIFT to show all cables.

**Click right button**

Provides a popup context menu giving access to appropriate actions on the object under the cursor.

**Double-click left button**

Edits the selected object. Exception: Double clicking an interface at the lower end of a connection when the **Select Interface Option** is set to "Select Cable" will open the **Assign Cable** dialog for that connection.

**Press and drag left mouse button**

Zooms in on the part of the diagram enclosed by the rectangle formed by dragging the mouse.

**Press and drag right mouse button**

Zooms out so that the part of the diagram that currently fills the window will fit in the rectangle formed by dragging the mouse.

Note that certain selectable objects appear within another object in the configuration diagram, for example, interfaces and segments within a controller. To select the controller, click on the text in the middle of the object; the entire controller and connections will highlight. To select a controller interface, click in one of the small boxes above or below which represent a channel interface or a device interface. Only the interface and its connections will highlight. Controllers

such as the 3990 are divided into two or more segments; to select a controller segment, click in the segment's lower third. The segment and its connections will highlight.

## Dialogs

HCM provides a series of dialogs to help you create, edit, delete, and connect objects, as well as manipulate the configuration diagram. For example, dialogs allow you to edit physical and logical information for a selected object, tailor your view of the diagram, or set parameters for a printed report.

Dialogs carry out two major functions: *navigation* and *editing*. You can navigate from a dialog to related dialogs, and edit data for a selected object. For example, you can navigate from the **Processor** dialog to the Partitions, CHPIDs and Edit Processor dialogs; in the **Edit Processor** dialog, you can edit information for the currently selected processor.

Configurations are hierarchical by nature. To reflect the hierarchy and to facilitate configuration maintenance, HCM provides an easy way to edit a lower object from a higher one by *nesting dialogs*. For example, after editing a processor, you can navigate to the appropriate dialogs to add or edit CHPIDs or partitions - without going back to the diagram.

*Multiple-action dialogs* include additional buttons that allow you to initiate actions without closing the dialog. If you have performed some action using these buttons that changes the data irreversibly, the **Cancel** button changes to a **Close** button. Note that the effect of the last update can be reversed with the **Undo** command.

## Online Help

In addition to the User's Guide, HCM comes with extensive, context-sensitive on-line help which describes each dialog in detail. Use the HCM User's Guide to find out how to do a particular task (for example, 'Connecting a patchport'), or to look up overview or reference information. Use the on-line help to find dialog-specific information while you are working in HCM (for example, what the **Edit...** button in the **CHPIDs** dialog does).

Most HCM dialogs have a **Help...** button which you can press to get information specific to the dialog currently open. You can also access on-line help at any time in HCM by using the **Help** menu:

- The **Index** command displays the Index of help topics.
- The **Keyboard** command displays the Keyboard Shortcuts topic.
- The **Using Help** command displays the Windows standard 'How to use help'.
- The **About...** command displays program specific information including the latest service level.

Each help topic in the HCM help system has a non-scrollable area at the top containing the dialog title and a See Also pop-up list box. Use the scroll bar and arrows to move up and down the help topic text. Notice that most help topics have words or phrases in the text highlighted in another color. You can browse related help topics by clicking on the *jumps* (highlighted phrases with single underline) in the text or under the "See Also" list box. You can click on a pop-up (highlighted word or phrase with dotted underline) in the text to display the definition for an HCM term. Jumps to related help topics can appear within pop-up windows.

Use the **Back** or **History** buttons in the help menu bar to retrace your path through the help topics. Use the **Contents** button to display the Index of help topics.

### Navigation Maps

For an overview of HCM dialog flow, click on the **Map** button in the help menu bar (or on the “navigation map” jump in the Index). The ‘Navigating around HCM’ help topic contains a list of different navigation maps illustrating how you can navigate to various dialogs. Click on a map jump to display that navigation map; you can then click on any box in the dialog flow to display the help topic for that dialog. You can also browse through the navigation maps by clicking on the “Previous Page” or “Next Page” jumps, or the “-continued-” box in the map.

**Tip:**

In the Connect Process help topic are two navigation maps explaining the dialog flow for connecting controllers to processors and connecting devices to controllers. Click on any box in the navigation map to display the help topic for that dialog. You can access the Connect Process help topic by clicking on the “Connect Process” jump in the Index of help topics.

### User Data Fields

In addition to characterizing an object with an ID, description, serial number, type, location, and so on, HCM allows you to define five data fields unique to your installation. For example, you may wish to record information such as the lease status, corporate asset number, or physical location (building and/or data center map grid) for a given piece of hardware. Use the **Field Names...** command from the **Options** menu to assign customized names to the user data fields.

**Tip:**

Consider using some of the fields for global items such as asset number and physical location, and some for local items such as data usage (for example “TMS databases”) for a string.

These fields can be specifically designated to appear in particular reports. The reports will be more readable if the names are 12 characters or less (e.g. “Asset No.”, not “Asset management number”). Any empty user fields for an object will not be printed. For example, if “Usage” is used as a local field for defining the data on a string, it will only appear in the String reports.

User data can be added and modified when editing an object by clicking on the **Info...** button on the edit dialogs for physical object, which opens the **Customize Field Names** dialog.

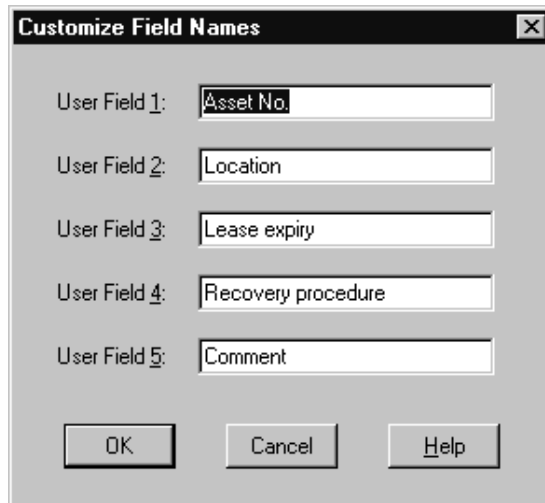


Figure 20. Customize Field Names

## Messages

HCM displays HCD messages as well as HCM messages.

### HCD Messages

HCM displays all HCD messages that it receives in dialogs on the PWS. Whenever HCD has a single message, the **Message** dialog appears.

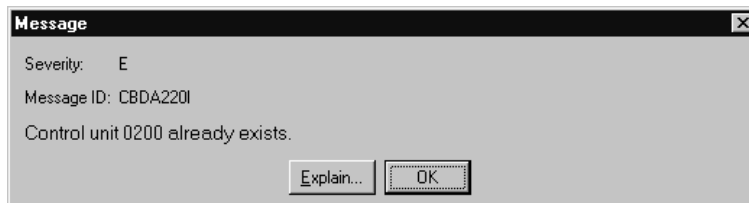


Figure 21. HCD Error Message

Click the **Explain...** button to open the **Message Details** dialog which displays more information about the selected message.



Figure 22. Message Details Dialog

Whenever there is more than one message, the **Message List** dialog appears. In the **Message List** dialog click on the **Save...** push button to save the messages

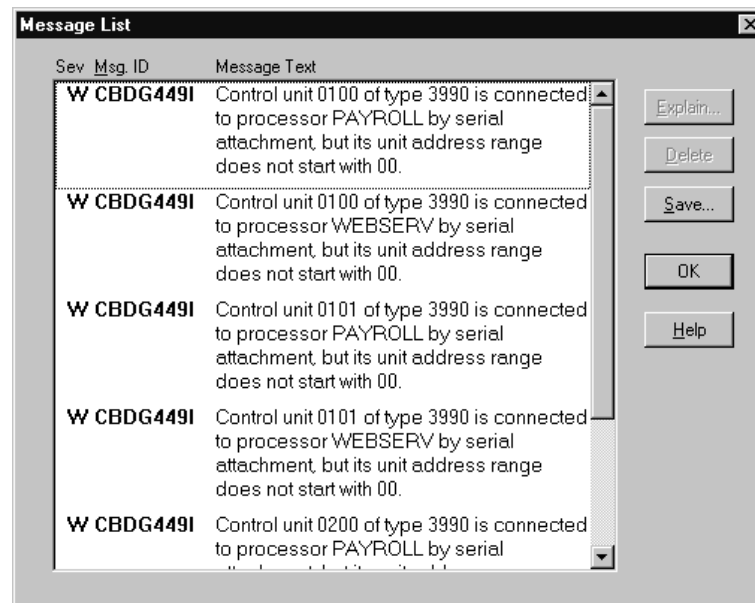


Figure 23. HCD Message List Dialog

into a file. Before saving certain messages you can delete those messages you are not interested in.

HCD messages start with “CBD”. Most HCD messages result from the user requesting a change to HCD that would create an invalid IODF. For more information about HCD error messages, see *z/OS HCD Messages*.

## HCM Messages

HCM messages are displayed in *message boxes* that describe the situation and sometimes request input. Most HCM messages result from the user entering incorrect or incomplete information in a dialog. These messages are self-explanatory and are not included in the list of HCM messages in Appendix A, “HCM Messages” on page 355.

Serious HCM messages are also displayed in message boxes and only have an **OK** button for you to acknowledge them. These messages start with “EEQ” and can be found under Appendix A, “HCM Messages” on page 355.



Figure 24. HCM Message

## Maintaining the Configuration Diagram

With HCM, you can build and maintain an interactive configuration diagram containing all the physical and logical information about your hardware configuration. HCM draws the objects, connections and text annotations in the configuration diagram in the clearest possible way. You don't have to worry about how the diagram will look when you create, edit or delete objects or when you filter your view; HCM will automatically redraw the diagram.

The following figure is an example of a configuration diagram.

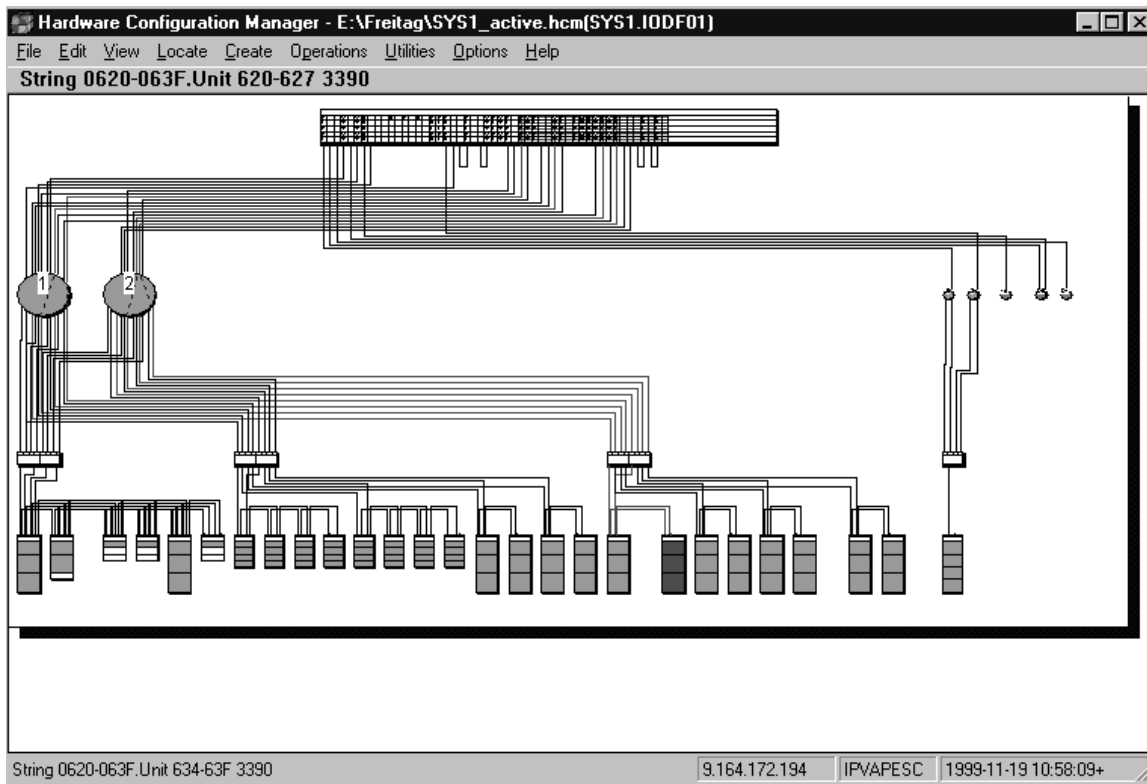


Figure 25. Example of a Configuration Diagram

## Connections in the Diagram

Connection lines on the diagram are drawn with different thickness, style, and graphics, with the following meanings.

Thick line	Bus and tag cable, permanent connections
Thin line	Mutable connections
Thick line with crow's feet	fiber trunk
Dashed line	Indirect connection. Some objects between the two that are connected by a dashed line are not currently included in the diagram.
Dotted line	Connection to uninstalled equipment.

When you selected to visualize a configuration, the connection lines may have a different meaning. Refer to "Visualizing ESCON or FICON Switch and Crossbar Switch Configurations" on page 37.

Certain objects such as controllers and strings can be marked as not yet installed; these objects (and cables attached to the objects) are drawn on the diagram with dotted lines running diagonally through them. To mark an object as uninstalled open the **Edit...** dialog for the object. Deselect the **Physically Installed** option by clicking in the check box, and press **OK**.

## Filtering Your View

You can tailor your view of the configuration diagram to focus on only the objects of interest. This results in a more readable diagram and will speed diagram drawing. Working with a subset of the configuration is easier than working with the entire diagram. Since many user actions require the diagram to be rebuilt (for example, connecting objects), you might have to zoom back into the area of interest after each of these actions. Cropping the diagram also results in better performance, since only that smaller portion must be recreated.

You can tailor a view to your needs in the following way:

Open the **Change View Attributes** dialog by choosing **Filter diagram...** from the **View** menu.

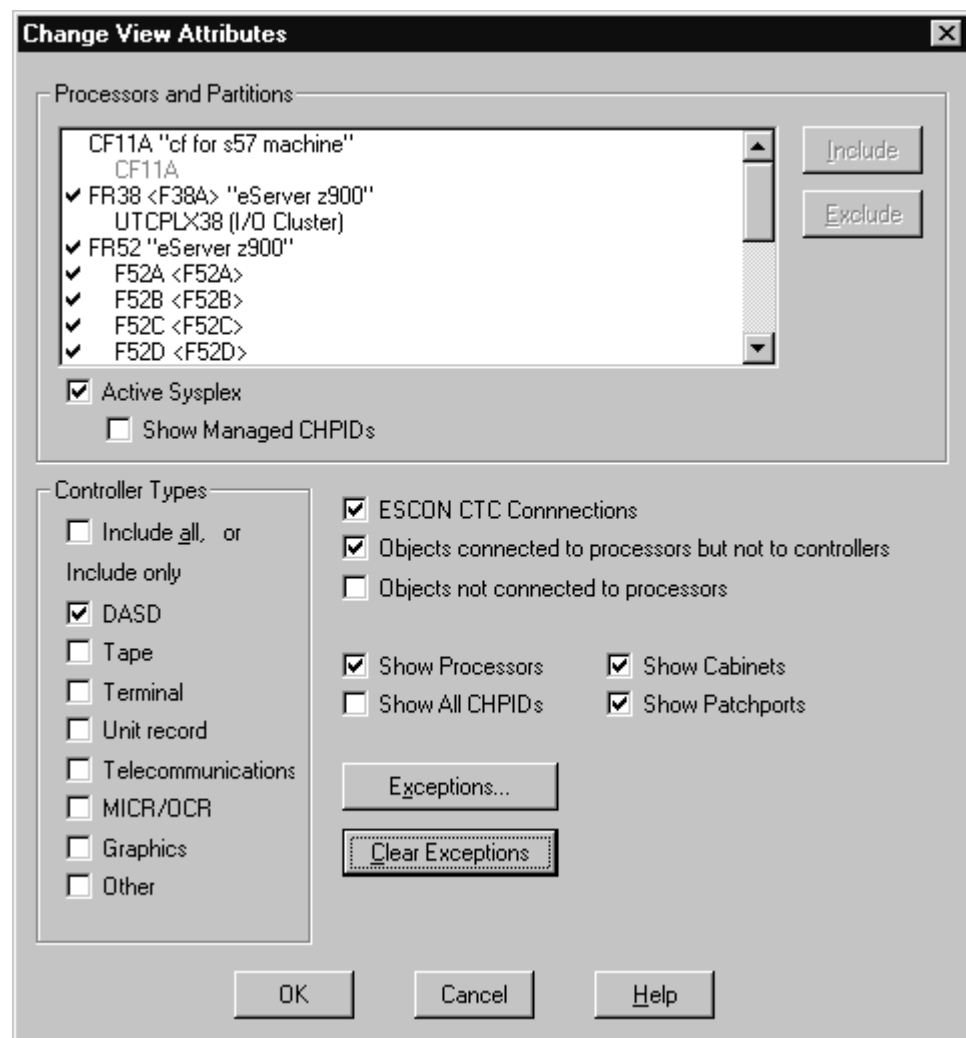


Figure 26. Change View Attributes Dialog

Use the dialog to include and exclude the types of objects you want to see. Note that you may set *exceptions* to the selected controller types in the **Change View Attributes** dialog with the **Exceptions** dialog. Exceptions allow you to include or exclude individual controllers in the class from the view.

After selecting the object types you can then select one or more objects and press F4 (Highlighted Objects) to further reduce the diagram for displaying just those objects.

The following commands in the **View** menu help you to tailor your view:

#### **Filter Diagram**

Allows you to specify which processors, partitions, and controllers are displayed to reduce the number of objects in the current view. The default setting for the **Include only List** is to show all DASD controllers; you can change the default and then click on **OK**. You can use the **Save Named View** option from the **View** menu to save the current view attributes to a named view. If you save the named view, it will become the most recently used named view.

By clicking the check box **Active Sysplex** it is possible to filter the diagram to those objects, which are part of the active sysplex on which the HCD host is running.

If the Active Sysplex is selected via the checkbox, the **Show Managed CHPIDs** checkbox is activated if there are any CHPIDs that:

- are contained in one of the processors that comprise the active sysplex,
- are defined as managed, and
- have an I/O Cluster value that corresponds to the name of the active sysplex.

By selecting this checkbox, an asterisk (\*) in the diagram at the corresponding channel interface indicates that a channel path is manageable.

You can display or hide controllers by including or excluding controller display classes in the **Exceptions** dialog following Filter Diagram (see “Editing a Controller” on page 88). You can also designate specific controllers to always be included (or excluded) regardless of whether their display classes are included. You can also display objects connected to processors but not to controllers, or objects not connected to processors.

The last specified filter is stored in the HCM config file across HCM sessions.

#### **Highlighted Objects**

Displays only those objects selected (highlighted) in the current view, resulting in a “cropped” view of the diagram. A *cropped diagram* is a subset of the entire configuration comprising the selected object(s) and any objects to which they connect. You can print customized cropped views as part of a report. Shortcut: press the F4 key. To open another view, use the **Filter Diagram** command and include and exclude the objects you want to be displayed.

**Tip:**

The **Highlighted Objects** command works as a shortcut for setting *exceptions*. For example, if you have the DASD class selected in the **Filter Diagram** dialog, select a single DASD controller in the diagram, and press F4, all other DASD controllers are set to “excluded”. That is, the diagram will display all controllers of class DASD *with the exception of* the DASD controllers which have been explicitly excluded. This results in a diagram containing only the selected controller.

## Saving Views

You can save views you might want to display again by choosing **Save Named View...** from the **View** menu. When you want to display a saved view, you can either press (F3) to display the most recently used named view or choose **Restore Named View...** to select a view from a list box.

A useful capability of named views is to create views that show all objects connected to a particular processor or partition, possibly filtered by controller type. For example, in a configuration where processors have test and production partitions, it may be useful to create one view for production equipment and another view for test equipment.

**Note:** A named view saves the individual objects as they are currently drawn on the diagram. When you restore a view, it does not show objects you added after saving the view although they might belong to the same object class shown in your named view.

The following commands under the **View** menu support you in saving views:

### **Restore Named View**

Allows you to choose a saved named view you want to display. To display the most currently saved named view you can use the shortcut F3.

### **Save Named View**

Allows you to either save the displayed view under a new name or to update an existing saved named view.

### **Delete Named View**

Allows you to delete one or more named views.

## Visualizing ESCON or FICON Switch and Crossbar Switch Configurations

HCM can evaluate information from ESCON or FICON switch or crossbar switch configurations. After you have selected a configuration for one or more switches, HCM evaluates the configuration data and immediately shows dedicated connections and blocked ports. In addition, when highlighting objects in a diagram, HCM uses the switch configuration data to show what particular route is used for CHPID-to-control-unit definitions. This is especially important when there are definitions in the configuration that have more than one possible physical route, for example when chained switches are used.

You can define and save several configurations and restore them whenever you want to visualize a particular configuration. Assume you have two processors that

are used as a backup for each other. Therefore, you have different switch configurations defined, for normal operation and for backup operation. When you define and save both configurations with HCM, you can always view which devices are accessible when a particular configuration is active.

When you select a configuration to be visualized the following is immediately shown within ESCON and FICON switches and crossbar switches:

Solid black line	Dedicated link between the ports
Gray port	This port is blocked
Black dot	In crossbar switches, a link between a crossbar channel interface and a crossbar control unit interface

In addition, when you highlight an object, HCM evaluates the configuration data and highlights the valid path from the CHPID to the control unit. It uses the following highlighting rules:

Within ESCON and FICON switches (internal routes)	
Solid line	There is dedicated link between the ports
Dotted line	There is a dynamic allowed link between the ports. If the link is prohibited, there is no line between the ports.
For cables (Physical routes)	
Solid line	Allowed physical route.
Dotted line	The visualized configuration does not allow the physical route.

In the following example, control unit 500 is logically defined to CHPID 20 and CHPID 21 using switch 3 as dynamic switch. Without visualizing the configuration, HCM would show all possible paths through switch 4.

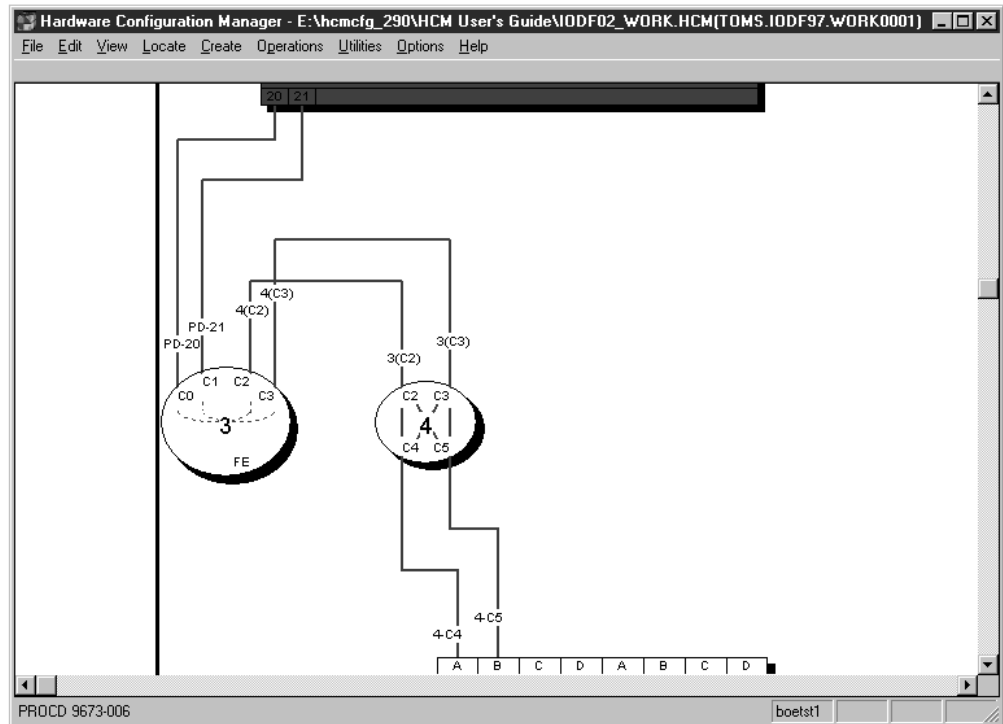


Figure 27. Highlighting an Object, without Visualized Configuration

Considering the switch configuration data of switch 4 that defines dedicated connections between C2 and C4, and C3 and C5, HCM highlights only the valid paths as shown. Note that the route in the dynamic switch is highlighted as a dotted line whereby the dedicated link is highlighted as a solid line.

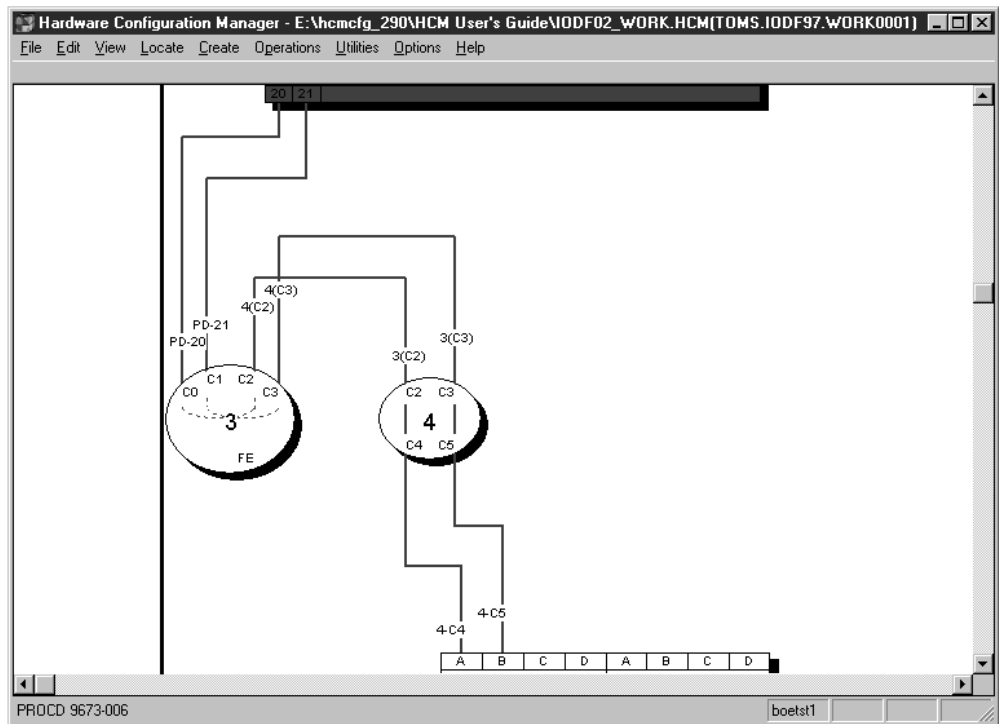


Figure 28. Highlighting an Object, with Visualized Configuration

To visualize a switch configuration, you first have to associate a particular switch configuration to each switch in your configuration using **Visualized Matrices...** from the **View** menu. The defined switch configurations are shown in your currently displayed diagram. You can save these definitions and display them later on again.

The following actions under the **View** menu support you in visualizing switch configurations:

#### Visualized Matrices

Allows you to associate an active configuration for each ESCON and FICON switch and crossbar switch in your configuration.

#### Restore Named Matrix Set

Allows you to choose a saved named matrix set you want to display.

#### Save Named Matrix Set

Allows you to either save a current matrix set under a new name or to update an existing named matrix set.

#### Delete Named Matrix Set

Allows you to delete one or more names matrix sets.

## Showing Page Breaks

You may see unexpected gaps on the screen, particularly between CHPIDs on a processor. These gaps are needed, because HCM must be able to split the entire configuration diagram into printable pages so that each output device can be printed as a whole on one piece of paper. Choosing the **Show Page Breaks** command from the **View** menu will display the breaks between the printable pages.

## Zooming the View

Other commands from the **View** menu allow you to change the size of the configuration diagram view:

### Fit to Window

Scales the diagram to completely fit in the HCM window. Shortcut: press the F2 key or CTRL+HOME.

### Zoom Out

Shrinks the diagram such that more of it fits in the window. Shortcut: press the HOME key. You can also zoom out by holding down the *right* mouse button and dragging; see “Mouse” on page 29. Note that as you zoom out, text becomes smaller and simpler, until it is no longer displayed because it is too small to read.

### Zoom In

Magnifies a portion of the diagram for a closer, more detailed look at objects. Shortcut: press the END key. You can also zoom in by holding down the *left* mouse button and dragging; see “Mouse” on page 29 above. Use the scroll bars which appear when you zoom in to navigate around the diagram. As you zoom in, text may appear as it becomes large enough to read.

### Actual Size

Scales the diagram such that objects are viewed at their approximate size when a diagram is printed at full size. *Full size*, or 100% scale, is the largest scale for printing diagrams. At this size, each controller will be about one inch tall and all text information for each object is visible. Shortcut: press the CTRL+END keys.

## Scrolling the View

As you zoom in to the configuration diagram, scroll bars will appear at the bottom and right hand side of the screen. Click the arrow buttons, click in the scroll bar, or drag the scroll box along the scroll bar to navigate around the diagram.

Alternatively, press the arrow keys on the keyboard to scroll the diagram up, down, left or right. To scroll the diagram half a page at a time, use PAGE UP (up), PAGE DOWN (down), CTRL+PAGE UP (left), and CTRL+PAGE DOWN (right).

Note that making or breaking a connection may move the selected object such that it is no longer visible in the current view. You may have to zoom out and then in, or scroll around to find the selected object.

## Controlling Text Detail

You can control the text that will appear in the diagram by selecting the **Text Detail** command from the **View** menu.

## Setting Preferences

You can display adapters on controllers grouped by segment or adapter, using the **Preferences** dialog from the **View** menu. You can also specify the shape for converters or compress the diagram horizontally. The settings you select will be saved for future HCM sessions.

### Grouping Adapters on Controllers

For controllers that have channel adapters, use this option to choose whether channel adapters (and device adapters) are grouped on the diagram by adapter or by segment. For example, a bus architecture

controller may have two buses, 0 and 1 (represented by segments in HCM) with four adapters each, A,B,C,D. Choosing **Group by Adapter** will order the adapters: 0A,1A, 0B,1B, 0C,1C, 0D,1D. Choosing **Group by Segment** will order the adapters: 0A,0B,0C,0D, 1A,1B,1C,1D.

#### **Long Hexagon / Pentagon**

Display all converters in the diagram as either elongated hexagons or pentagons.

#### **Compress diagram horizontally**

Compresses the width of objects to result in a more concise diagram. Less paper will be used to print the diagram, but cable descriptions may overlap, making them difficult to read.

## **Showing Screen Elements**

You can show or hide elements of the HCM screen with the following commands from the **View** menu:

#### **Object Information Bar**

Shows or hides the Object Information Bar at the top of the screen. This bar contains information about the objects and their connections currently under the mouse cursor. Moving the cursor across objects causes this information to constantly change.

#### **Status Bar**

Shows or hides the Status Bar at the bottom of the screen. This bar contains information about the most recently selected object as well as miscellaneous messages. If you have selected more than one object, the information shown pertains to the last one selected. In addition, you can find information about the Login target, Active Sysplex name, Focus host and Time of last Refresh.

#### **Show Page Breaks**

Shows or hides the page breaks that occur when the diagram is printed at full size. The white space between each pair of lines represents areas that are unprintable with the currently selected printer and paper size.

## **Specifying Options**

You can ask HCM to always confirm a **Delete** command; that is, when you delete an object or disconnect an interface, HCM will ask you if you are sure you want to delete or disconnect. Choose **Confirmation** from the **Options** menu, select the checkbox and press **OK** (confirmation “on” is the default).

HCM offers the possibility to choose the action that is performed when double-clicking on a Control Unit or String interface. You can choose to either edit the physical cable assignment for the interface or edit the Control Unit or String that contains the interface.

## **Showing System Status Information**

HCM interfaces with I/O Operations on the host, which enables you to graphically view the objects in the active sysplex. For details, see Chapter 11, “User Interface to I/O Operations” on page 187.

## Receiving Visual Warnings

HCM will warn you of any likely errors between physical connections and logical definitions. The warnings take the form of coloring objects and connections in the configuration diagram. You can specify which warnings are enabled, as well as the color each warning displays.

To display physical-logical inconsistencies, objects are filled and cables are drawn with the appropriate color. If an object has more than one warning, HCM displays the highest priority warning. Note that selected objects and cables appear highlighted in the standard red color, and take priority over visual warning colors.

Note that when you run in a video mode with only 16 colors, the visual warning colors may be different for objects than for cables: objects are painted with brushes which support patterns, but cables are painted with pens which do not. You can display the **Colors** dialog by choosing **Colors...** in the **View** menu. Use this dialog to customize the visual warnings for a given workstation.

**Note:** You can use the visual warning colors, for example, after a loading or a resynchronization process. This has an impact on the performance. For information on the resynchronization process, see “Resynchronizing Config Files and IODFs” on page 54.

## Printing the Diagram

You can print the entire configuration diagram or only those objects in the current view (see “Filtering Your View” on page 35). Choose **Print Diagram** in the **File** menu to scale the diagram, calculate the number of pages that will print at the selected scaling factor, or fit the diagram to print on one page. See Chapter 12, “Reports and Diagrams” on page 193 for more details.

Color printing is also supported.

## Selecting Objects

Click to select an object in the configuration diagram; the object and all its connections will highlight, and the **Edit** and **Locate** menus automatically list the object in temporary menu commands. You can SHIFT+click (left) to highlight and display only those cables connected to the selected object to simplify your view (click to re-display all cables).

### Tip:

Since objects in the diagram can be quite small, zoom in to the area of interest before selecting the desired object. You can also identify the object using the **Locate** menu or the Object Information Bar at the top of the screen.

Some objects are contained within other objects: for example, controllers contain segments and switches contain switch ports. To select a controller, click in the middle of the area below the channel interfaces. To select a segment, click in the region just above its device interfaces. To select a switch, click on it anywhere except on a switch port. To select a switch port, click immediately inside the switch adjacent to its connection, or on its connection up to the first bend. In general, you can select objects by clicking on their text labels.

Actions such as delete or locate act on the most recently selected object. Note that you can *highlight* the connections for more than one object at a time by using

CTRL+click (left). However, highlighted objects are not multiple *selected* objects, so you cannot delete or locate more than one object at a time.

### Locating Objects

In a large configuration diagram, it may be difficult to find the object in which you are interested. Use the **Locate** menu to quickly find an object. When you select a type of object from the menu, a dialog appears listing objects and their attributes. You can select one or more objects in this list. The selected object or objects will be made visible and highlighted in your configuration diagram

Select the **Columns...** push button to choose other attributes to be shown in the

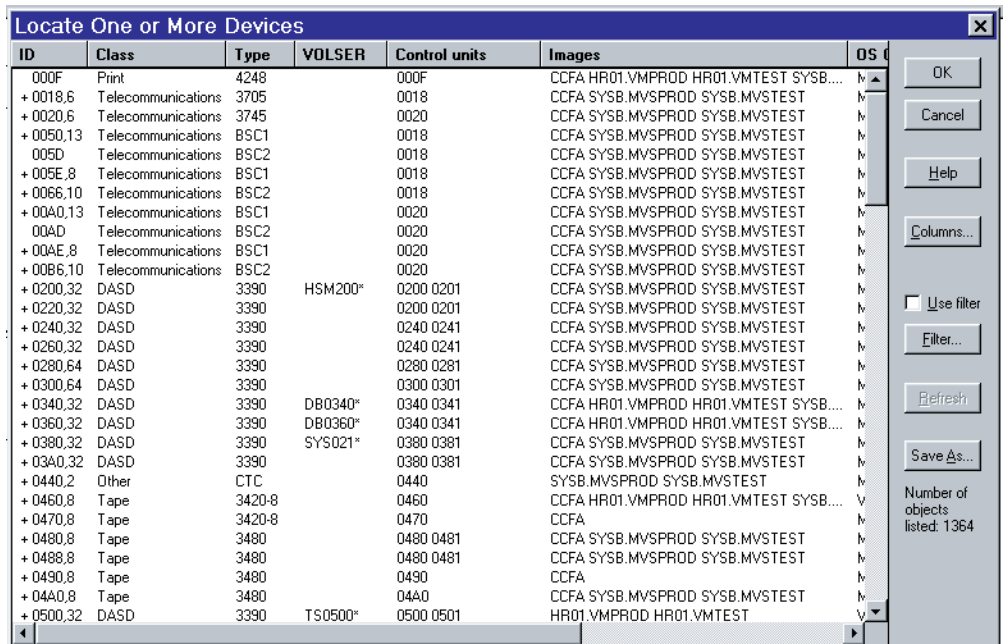


Figure 29. Selection List for Locating Objects

dialog. You can change the width of each column by selecting the black line that separates the column headings and dragging it to the left or to the right. You can sort the order in a column from ascending to descending by clicking on the column header.

Columns and filter setting are saved across HCM session.

Use the **Filter...** button to reduce the list of objects in the dialog. When you press this button you will be presented with a window in which you can select the objects you wish to locate. This reduces the size of the selection list in the **Locate One or More Devices** window for clarity. Your selection will be kept across HCM sessions.

**Note:** After editing an object it might not meet your filtering criteria any longer. It, nevertheless, does not disappear from the object list. To update the list you have to press the **Refresh** button.

**Tip:**

You can also use the selection list with its filter and arrangement capabilities to analyze the content of your configuration.

**Tip:**

After using the edit, create, scrolling, or zooming commands, you may lose sight of your most recently selected object. To relocate it, simply open the **Locate** menu and select the object which is shown as the first item in the menu list. (Shortcut: press F8).

The first menu item in the **Locate** menu is only valid, if you recently selected only one object.

The **Locate** object and **Edit** object windows contain a **Save As...** button. This button allows all the listed objects, including the displayed columns, to be saved to a file in a format that can be used by a spreadsheet program (such as Lotus 1-2-3). Together with the capabilities of the enhanced **Filter** mechanism in the **Locate** and **Edit** menu, this allows HCM configuration reports to be created according to criteria specified by the user.

---

## Creating Objects

You can create new objects in the configuration diagram using the **Create** menu. The **Create** menu has individual menu items for each type of object.

All other objects are created by editing the object that contains them. The main dialog for the containing object allows you to navigate to other dialogs in order to create the contained objects. For example, you can open the **Partitions and CHPIDs** dialogs from the **Processor** dialog in order to add Partitions and CHPIDs to the selected processor.

You create an object by filling in details in the appropriate **Create...** dialog and pressing **OK**. See the details for the specific **Create...** dialog in Chapter 6, "Modifying Objects in Your Configuration" on page 77.

---

## Editing Objects

You can edit an object by clicking on it in the diagram, then selecting the customized **Edit:object** command from the **Edit** menu (or press F9). Shortcut: double-click on the object in the diagram. Alternatively, you can choose the object's type from the **Edit** menu. A list of objects appears, that you can filter and rearrange in the same way as described in "Locating Objects" on page 44.

For more details, see the section for the specific **Edit...** dialog in Chapter 6, "Modifying Objects in Your Configuration" on page 77.

The **Interface Selection...** command under the **Options** menu allows you to select which type of dialog will appear when you select an *interface* to edit: you can either edit the physical cable assignment for the interface, or edit the object which contains the interface.

Edit dialogs often lead to related dialogs allowing you to connect objects. See the section for the specific dialogs in Chapter 6, “Modifying Objects in Your Configuration” on page 77 for more details.

---

## Deleting Objects

To delete one or more objects, click to select them in the diagram, and choose **Delete** from the **Edit** menu. Shortcut: press the DEL key after selecting the object. HCM will first disconnect the object and then delete it. If the **Confirm on Delete** option is on, HCM will ask you if you want to delete the object before actually deleting it. See “Specifying Options” on page 42 for more details.

You can use the **Undo** command immediately after a **Delete** to reverse it.

### Note:

Most subobjects, such as partitions, segments, and interfaces (including paths) cannot be deleted from the diagram. You can delete subobjects by editing their containing objects. For example, to delete a CHPID, double-click on the appropriate processor, click on the **CHPIDs...** button, select the CHPID from the list box displayed, and press the **Delete** button.

Selecting an interface and pressing the DEL key will only disconnect it. This only applies to interfaces at the bottom of a connection: channel interfaces, string interfaces, crossbar channel interfaces, and upwards-facing switch ports.

Strings and units that are integrated into a controller are not visible in the configuration diagram. They can only be accessed through the **Edit** menu or in the **Controller** dialog. Select a string and press the **Delete** button in the Strings section of the **Controller** dialog; HCM will display a confirmation dialog before deleting the string.

---

## Reversing an Action

The single level **Undo** command will reverse or “undo” your most recent action in HCM. Select the command from the **Edit** menu. If the previous action cannot be undone, the command changes to **Can’t Undo**.

---

## Ordering Objects

You can order objects on the screen and in reports by using the **Order** dialog. Click on the **Order...** button in the appropriate dialog. For processors, select the **Order Processors...** command from the **Edit** menu. The standard order dialog will appear with two list boxes, one showing the objects in the current order, the other showing the objects in the new order after they have been rearranged with the **Add>>** button. The **Add>>** button adds an object selected in the Current Order list box to the end of the New Order list box. The **<<Remove** button removes the object selected in the New Order list box and places it back in the Current Order list box. Shortcut: Double-click on any item to move it.

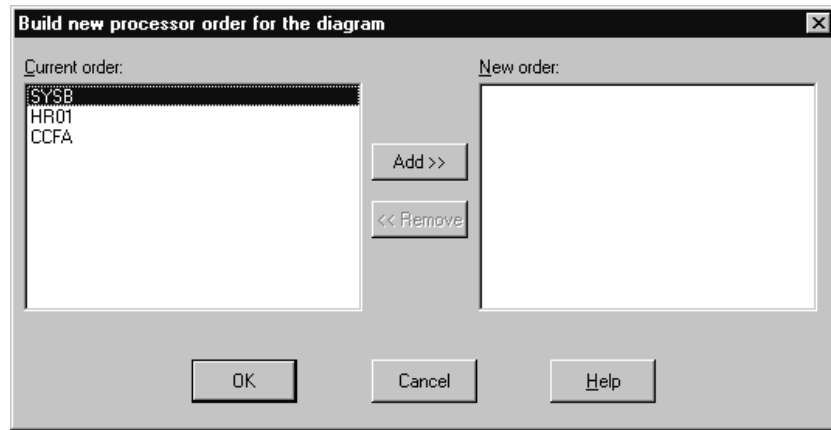


Figure 30. Build New Processor Order for the Diagram Dialog



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## Chapter 4. Building Your Configuration

This section begins by describing how HCM works with HCD: data integrity between the IODF on the host and the config file on the PWS; and the IODF load/resync process. This is followed by an explanation of physical and logical objects in the configuration diagram. The last part of this section is devoted to getting you started in HCM, taking you through the process of creating a new configuration from an existing IODF. You can also create a new configuration from scratch, open an existing configuration, or copy, save and close your configuration or IODF.

HCD uses the IODF to store the logical configuration data defined for the operating system and the channel subsystem. HCM, running on a PWS, acts as a “graphical front end” to HCD: loading the IODF into HCM allows you to build an associated, interactive configuration diagram in a config file. You can supplement the IODF logical data with physical information about the physical hardware aspects, such as cabinets. Each physical object is a graphical object in the diagram. HCM keeps the IODF in sync with its associated config file as you make changes. Due to the client/server relationship with HCD, all changes of the logical I/O configuration are immediately written into the IODF at input time and fully validated and checked for accuracy and completeness by HCD.

You can create a new configuration either by creating a new config file and IODF, or by populating a new config file with data from an existing, prepared IODF (most common case). You can open and/or resynchronize an existing configuration by opening the config file with its associated IODF or against a different IODF. You may wish to copy the config file and IODF to backup files before making changes; this is useful when planning possible future alternatives to your system configuration.

After you have created or opened a configuration, you can modify it. HCM allows you to easily create, edit, connect, disconnect or delete objects in the diagram. (See Chapter 6, “Modifying Objects in Your Configuration” on page 77 or Chapter 7, “Connecting Objects in Your Configuration” on page 127). When you are finished, close your configuration. This saves your changes in the config file and associated IODF.

---

### HCM and HCD

HCM is the graphical user interface to HCD. However, HCM runs on a workstation and HCD runs on the host. The host systems require an internal model of their connections to devices, but it is far more convenient and efficient for you to maintain (and supplement) that model in a visual form. HCM maintains the configuration data as a diagram in a config file on the workstation in sync with the IODF on the host.

The *IODF* contains only logical definitions; the *config file* contains a subset of the logical data from the IODF, plus physical information added using HCM. Together the IODF and the config file data form a single data source or repository. This gives you a complete view of both the logical and physical aspects of the hardware configuration.

HCM interacts with HCD in a client/server relationship:

- HCD ‘owns’ all data stored in the IODF, and carries out all validation of that data. Error messages relating to the IODF come from HCD. Note that an IODF created in HCM is not different from an IODF created in HCD; no HCM data is stored in the IODF.
- HCM ‘owns’ the data in the config file; all validation of the physical data and error messages relating to that data come from HCM.

Each config file is associated with a single IODF; think of the config file as an extension to the IODF. When you open the config file, its associated IODF is automatically opened. You can open the config file against a different IODF, for example, if the associated IODF was damaged or renamed in HCD.

You can have multiple config files associated with a single IODF. However, this is not recommended. Every time the IODF is updated through one of its config files, all the rest must resynchronize with the IODF the next time they are opened (see “Data Integrity between the IODF and Config File” on page 53).

HCM works with one IODF at a time. Use a single IODF in your data center to make the most effective use of HCM. Note that you can merge IODFs.

HCM can be used with work IODFs or production IODFs, but can only update work IODFs. A *work IODF* can be modified and updated; it serves as your ‘working copy’. A *production IODF* cannot be updated; it is the machine-readable IODF used by z/OS to define the system configuration. (You can copy a production IODF to a work IODF, or create a production IODF from a work IODF; see “Copying Your Configuration” on page 68).

You may wish to backup the IODF and config file before making changes. Use the **Copy to Backup** command under the **File** menu to copy both files and leave the originals open for you to work on. To only copy the IODF, use the **Copy...** command on the **IODFs** dialog. See “Copying Your Configuration” on page 68 for more details.

## Relation of Configuration Files and IODFs

With HCM you can create *work configuration files* (with the file extension \*.HCM) and *production configuration files* (with the file extension \*.HCR). These configuration files are associated with the IODF data sets, forming a work or production pair. Figure 31 on page 51 illustrates the relationship.

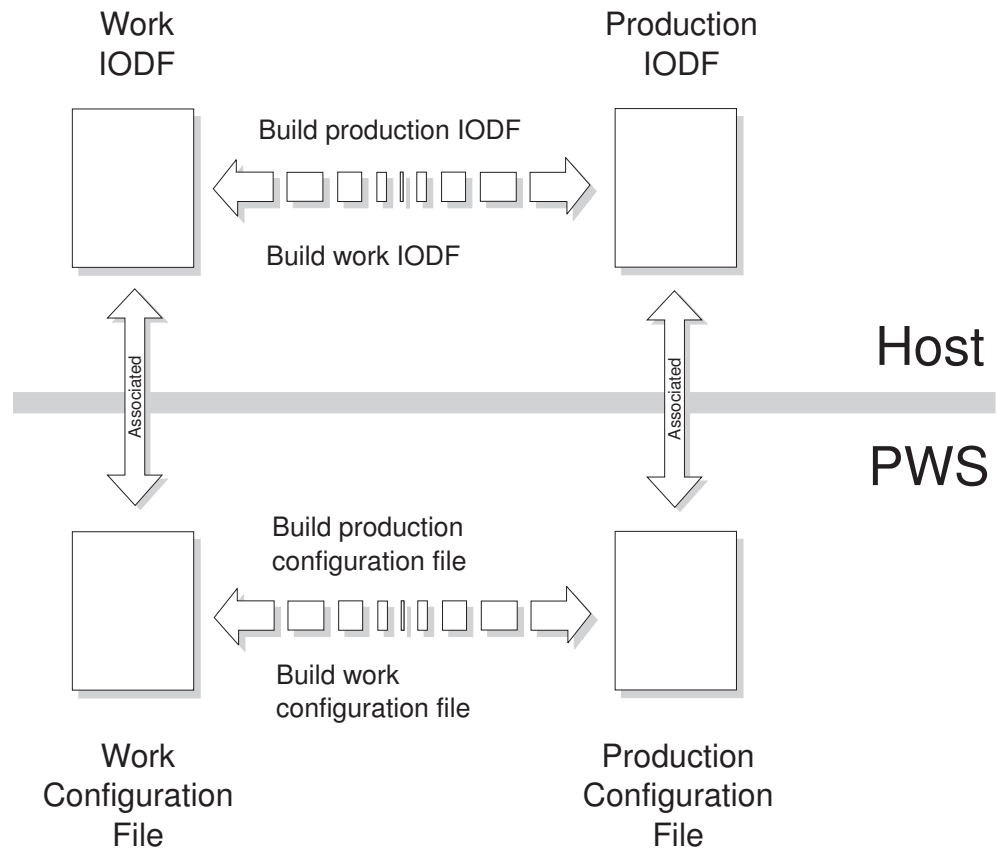


Figure 31. Configuration Files and IODFs

HCM provides menu choices for the transformation of the currently opened IODF into either a work IODF data set or a production IODF data set. You can select these choices from the **File** menu. The choices are **Build Production...** and **Make Work...**. According to the action a work configuration (\*.HCM) file or a production configuration (\*.HCR) file on the PWS is created.

The function **Build Production...** creates a production IODF as well as a production configuration file. These two production files are associated. That means when you open the production configuration file, the production IODF is opened as well.

When you create a production IODF, a production configuration file is created. This new file is:

- Synchronized with the host production IODF.
- Marked internally as different from a work configuration file.

The function **Make Work...** creates a pair of associated work files, the work IODF and the work configuration file.

Either a production pair or a work pair can be used as a starting point for further changes.

### Characteristics of the Production and Work Configuration File

This section describes the characteristics of the production configuration file and the work configuration file that you can create in HCM.

**Production Configuration File:** Within an opened production configuration (\*.HCR) file the physical and logical data cannot be modified. Like the production IODF, the production configuration file is a read only file for HCM. Trying to perform actions causing a configuration change results in an error message.

However, under the following circumstances HCM alters the content of a production configuration file:

- An upgrade (and potentially a resynchronization) of the file content is required. One possible reason is that the file was saved by a former release of HCM.
- A resynchronization of the file is necessary if the IODF is no longer in a state of synchronization.

A production configuration file contains the complete information that a production IODF contains and, in addition, the physical information stored in HCM.

**Note:** A production configuration file contains the complete information about the logical and physical configuration, but you cannot create an IODF out of a production configuration file.

This allows the production configuration file to display information on all dialogs, diagrams, and reports in the stand-alone mode. For more information refer to Chapter 5, “Standalone Mode” on page 71. This information is stored in the production configuration file (as well as in the production IODF) and cannot be changed. This additional information is the reason for the larger size of the production configuration file. It is larger than the work configuration file from which it was created.

The additional information includes:

- Switch and port configurations
- Operating system related definitions
- Unit addresses and some other information from the device <=> processor and CU <=> processor relationships

If you work with HCM in on-line mode and you open a production configuration file, you can create a work IODF/\*.HCM file pair from the production IODF/\*.HCR file pair. To perform this task, use the **Make Work...** command in the **File** menu. See “Making a Work or a Production IODF” on page 67 for more information.

**Work Configuration File:** If the open file is a work configuration (\*.HCM) file, you can change the configuration. If you are in on-line mode, all physical and logical data is available in HCM. In stand-alone mode, HCM cannot report or display certain data because the data is not present in the \*.HCM file. This data is only stored in the IODF data set on the host. In detail, the following data is not available in stand-alone mode:

- Switch configuration data
- Operating system related data
- Logical data of control unit - processor definitions
- Logical data of device - processor definitions

#### **HCM configuration files**

The term *config file* is used for both *work* configuration files (\*.HCM) and *production* configuration files (\*.HCR).

## Data Integrity between the IODF and Config File

The IODF is updated automatically during an HCM session. The config file is only updated when you save or close the configuration, or if you exit HCM. The **Save** command under the **File** menu commits any IODF changes (no longer able to Undo), and saves the config file. The **Close** and **Exit** commands also commit all changes. You cannot close the IODF and config file without committing your changes.

There are cases where the IODF gets out of sync with the config file; that is, the connectivity data in all config files associated with that IODF no longer match the contents of the IODF. See “The IODF Load / Resync Process” for cases where the local IODF database must be refreshed from the host. HCM detects and resolves this situation by examining a last-updated specific token when the IODF is opened with a config file. HCM re-reads and resynchronizes the config file with the IODF if necessary.

### Concurrent Use by Multiple Users

More than one user can use HCM with the same IODF and config file, *provided none of the users is updating*. HCM initially opens the IODF and config file for read-only use, only acquiring update access for each user when required. HCM attempts to acquire exclusive update access when a user wants to update. Only one user is allowed to have access for update. If this fails, the update is refused (that is, someone else is accessing). The session continues in read-only mode.

You may grant certain users access to only the IODF or only the config file, by using the workstation and host security facilities (for example, RACF on z/OS). A user with config file access may only update some physical data (for example, configuring fiber management cabinets), but cannot alter the IODF logical data (for example, connecting controllers to processors).

To provide read access for multiple users, you can distribute a production configuration file electronically, or place the file on a central shared disk resource (for example, LAN) for common access.

**Note:** In case a SAMBA/SMB server is running on the host, it is also possible to provide access to the file system of USS for your workstation. You then can access the file system of USS as if it were a local drive or a LAN drive. Storing an HCM configuration file on the file system of USS means that the HCM configuration file then resides on the host. Note that when you establish the connection between HCM on your workstation and HCD on the host via TCP/IP, you always have access to USS as well as a home directory in USS. Hence, you could also save HCM configuration files in your USS directory (or any other location in the USS file system where you have access).

## The IODF Load / Resync Process

In addition to the physical data which resides only in the config file, HCM maintains a *local copy* of relevant logical connectivity data from the IODF. This local copy enables HCM to display logical information without time-consuming interactions with the host. Any changes you make are written both to the local copy and to the IODF on the host. Since the local data is saved with the config file, HCM does not have to re-read it from the host each time the config file is opened. However, there are some cases where the entire contents of the local IODF database must be refreshed from the host:

1. The first time a config file is created from an IODF (*IODF Load*). See “Loading the IODF” on page 61 for more details.
2. When the IODF on the host is modified outside of HCM by using, for example, the HCD ISPF interface. HCM will detect that the IODF on the host is out of sync with the local copy, and will re-read the local IODF data when the config file is next opened (*IODF Resync*).
3. Updating only one config file of several associated with the IODF (*IODF Load and Resync*).
4. If the connection between the workstation and host is lost during an HCM session, IODF data may be more current than config file data, since the IODF is updated automatically but the config file is only updated on a Save, Close or Exit (*IODF Resync*).

Generally, resynchronizing the IODF logical data has the following effect on the physical configuration:

1. New physical objects are created where appropriate.
2. New physical connections are made *as long as they do not conflict with an already existing physical connection*. Existing physical connections remain.
3. Any ‘old’ physical objects and connections that are no longer mentioned in the IODF remain, except for certain physical objects that depend on the existence of corresponding logical objects. For example, a physical director will be disconnected and deleted if its switch has been deleted from the IODF.

The following table gives an overview on what happens when you load an IODF or when an IODF is synchronized:

*Table 2. IODF Load versus IODF Synchronize*

Action	Result	More Information
Loading an IODF	Creates a new config file. If you specify an already existing config file name, all currently stored information in the existing config file is completely overwritten. It is lost.	See “Loading the IODF” on page 61
Resynchronizing IODF and config file	The local copy of all logical configuration data in the config file will be overwritten with the data of the IODF. The physical data is generally kept.	See “Resynchronizing Config Files and IODFs”

## Resynchronizing Config Files and IODFs

Resynchronization between a configuration file and an IODF is a time consuming process - the definitions of both files are compared and then the configuration file is updated. HCM can resynchronize both work configuration files and production configuration files.

When you open a config file, HCM checks whether the config file on the workstation and the related IODF on the host are in sync. If they are out of sync, HCM can

- Resynchronize the content of the configuration file with the IODF on the host
- Access the content of the configuration file as read-only.

When you select to synchronize the content, the local copy of all logical configuration data in the config file will be overwritten with the data of the IODF. Generally, the physical data is kept.

The resynchronization operation is indicated by the following dialog:

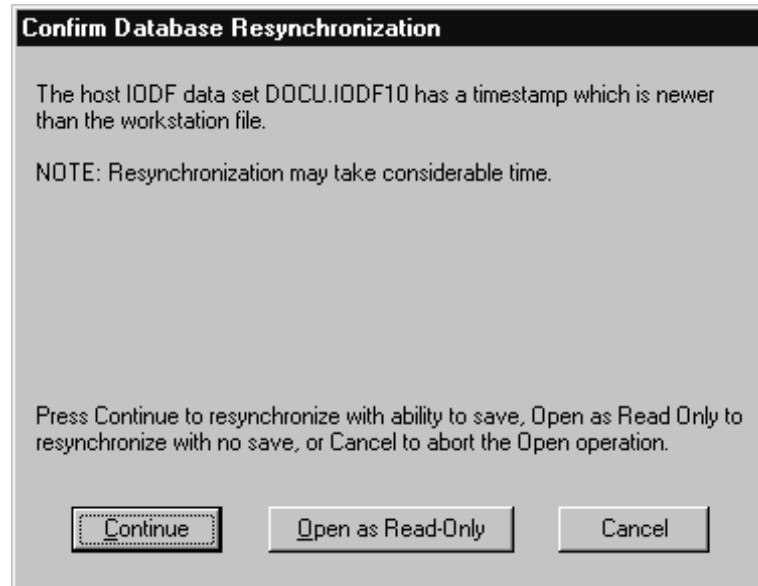


Figure 32. Confirm Database Resynchronization Dialog

If you select the **Continue** button, HCM performs the resynchronization operation. Visual warnings may pop-up to indicate inconsistencies between logical data and the physical infrastructure. Before you work with the config file or save it, resolve these conflicts. See "Receiving Visual Warnings" on page 43 for information on how visual warnings work and on how you can enable them.

If you select the **Open as Read-Only** button, a resynchronization takes place but the configuration file is not saved and you are not allowed to edit the configuration file - regardless whether a work or production configuration file is open.

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## Physical and Logical Objects in HCM

The IODF contains information on *logical* objects and how they are defined to each other. HCM displays *physical* objects and their connections in the configuration diagram, and contains the logical information associated with the physical objects in dialogs. For example, a device may be logically defined to a processor; however, *physically*, the device may reside in a unit in a string which connects to a controller daisy-chained to another controller, leading to a series of crossbar switches which finally connect through a CHPID to the processor. The configuration diagram shows all the connected physical objects; the device  $\Leftrightarrow$  processor logical definition information can be found in the appropriate dialog.

The processor only needs to know the logical routing that reaches the desired device—the logical definition. As a system administrator, you need to know how the processor and device are connected—the physical configuration—as well as the logical links.

**Tip**

Since HCM usually makes both the physical connection and logical definitions in the same step, the logical definitions will usually have corresponding physical routes. However, situations may arise where the logical definitions and physical routes do not match. HCM highlights these cases in the configuration diagram; see “Receiving Visual Warnings” on page 43 for details.

In HCM, most physical objects contain logical objects (for example, cabinets do not contain logical objects, but patchports, and patchports are physical objects). A logical object is contained in a physical object and in most cases, permanently associated with it. However, an operating system is a logical object, but is not contained in a physical object. Physical and logical objects are associated during IODF Load or Resync, or when the logical object is created and added to a physical object in HCM. To identify the logical objects that are associated to a physical object, the serial numbers are a major guide. For example, when assigning control units to controllers, especially in dual mode controllers.

The process of mapping logical definitions into physical objects during the Load process creates the configuration diagram in HCM. This process requires the following data:

**For processors:**

Any multiple processors in the IODF which belong to the same physical processor (for example, when the same processor is defined once in BASIC mode and once in LPAR mode) should have the same serial number or SNA address.

**For control units:**

Control units which belong to the same controller should have the same serial number (for example, the two control units in a 3990 DASD Subsystem). HCM relies on this to resolve ambiguities where other information is insufficient to make this determination.

**For devices:**

Devices which are physically in the same string should have the same serial number; when you have more than one device with the same device number, HCM uses the serial number to determine whether the devices are physically identical. It is usually sufficient to assign serial numbers to just the first device in each string, as devices with the same serial number will be placed in the same string. Note that if two devices have different device numbers but the same serial number, they are considered to be in the same physical string.

See “Preparing the IODF” on page 58 for details.

**Note:** HCM does not check if the serial numbers are accurate, but checks if the serial numbers are identical or not.

## Graphical Representation of Physical Objects

HCM represents controllers and string objects in the configuration diagram based on their *physical descriptions*. The Physical Description Files, or *PDFs*, are templates that you can tailor. They are similar to HCD UIMs, except that the PDFs contain physical rather than logical information.

HCM comes with generic PDFs for controllers and strings, as well as PDFs for selected IBM equipment. For example, the PDF for a 3990 controller specifies that it is divided into two sections, each of which contain control units. Sample PDFs are also included which may serve as examples of how you might create PDFs for non-IBM equipment.

IBM's partner Thorntree Software, Inc., offers the possibility to download further Physical Description Files, generated by HCM users, from its Web site ([www.thorntreesoftware.com/PDFs.htm](http://www.thorntreesoftware.com/PDFs.htm)).

You can modify the PDFs for objects as part of preparing the IODF for use in HCM (see "Preparing the IODF" on page 58).

Unlike HCD UIMs, you do not need a PDF for each controller and string type in your configuration. PDFs are only required in special circumstances, where the controller or string would not appear correctly in the diagram using the default PDF. For example, PDFs are required in the following situations:

1. For most DASD controllers, which typically contain two segments. (Note: segments may also be known as storage clusters, storage directors or busses, depending upon manufacturer and model.)
2. For controllers, which have a hierarchical internal architecture, such as the interfaces within channel adapters contained in busses (generically referred to as *segments* in HCM).
3. For tape controllers, such as the 3803 and 3480, which connect to peers via communicator cables.
4. For controllers and strings which number their interfaces with a scheme that differs from A, B, C...

**Note:** The filename extension for physical description files was changed from ".pdf" to ".txt" for HCM 2.9 Service Level 3 and higher. Nevertheless, HCM 2.9 Service Level 3 and higher can still read physical description files having the extension ".pdf".

### How PDFs are Assigned to Objects

A controller is assigned to a particular PDF in one of the following ways:

1. When an HCM file is first created by loading an IODF (or when opening an existing file which causes an IODF resync), HCM uses the "preferred PDF" for the controllers it automatically creates. The preferred PDF for a given control unit type is determined by searching the three controller PDF directories for a PDF with a matching control unit type. The CPDFA directory is searched first, then CPDFB and CPDFC. The preferred PDF comes from the *first* directory where a match is found. If more than one matching PDF is found in that directory, the one that comes first alphabetically will be used as the preferred PDF. If no PDFs are found in any directory, HCM uses the default PDF, which is a single-segment controller with one channel interface labeled "A".
2. When a new controller is created within an existing HCM configuration, HCM will find all of the PDFs in all three directories that match the control unit type

chosen by the user. If exactly one is found, then that one will be used. If two or more are found, the user will be prompted to choose the correct one. If none are found, the default PDF is used.

3. An existing controller can be edited and given a different PDF. In this case, any PDF may be chosen, even ones that do not match the control unit type.

When an IODF load is first performed, HCM (as shipped) will assign IBM PDFs to all equipment requiring PDFs, such as 3990 controllers. However, if most of your equipment is "brand X", or if there are multiple IBM PDFs for a given control unit type (e.g. 3990), you may wish to move the PDF best representing your equipment of that type into the CPDFA directory before loading your configuration for the first time. See Chapter 17, "Physical Description Files (PDFs)" on page 339 for more details.

PDFs are assigned to strings in a similar manner. PDF selection is possible during the Load IODF process and via the Import function when importing into a new config file. See Chapter 15, "Importing and Exporting Data" on page 283 for more information.

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## Creating a New Configuration from an IODF

This section leads you through the process of creating a new (and possibly your first) configuration from an existing IODF. If you want to create a new configuration from scratch, see "Creating a New Configuration from Scratch" on page 64.

Essentially, you create a new configuration by loading data from the desired IODF on the host into a config file which is created on the PWS. However, the logical data in the IODF is not sufficient by itself to create an accurate physical representation of your hardware configuration. Although HCM can correctly infer certain physical relationships from the logical data, in general, the logical information is either lacking or ambiguous.

HCM makes extensive use of *serial numbers* added to the IODF to resolve these ambiguities and create an initial physical configuration diagram that is as correct as possible. If you have not consistently and accurately maintained serial numbers in the IODF on the host, you will need to rectify this by preparing the IODF before loading.

HCM can recognize CTC connections, if all control units (CUs) composing a CTC connection of a CNC/CTC channel pair through a switch are connected to switch ports.

Point-to-point CTC connections are recognized, if the involved CUs of a CNC/CTC channel pair have the **same** serial numbers.

## Preparing the IODF

To get an accurate configuration diagram for HCM, you have to prepare your IODF before using it with HCM. If you start with a production IODF, you first have to create a work IODF out of your production IODF (see "Create Work and Production IODFs Without the Associated Configuration Files" on page 67). In the following description it is assumed that you use a work IODF for the preparation steps and for the loading into HCM.

If you have switches in your configuraton, HCM can only represent connections of control units to channels of processors in an adequate manner, if the control-unit-to-port connections and the port-to-CHPID connections are defined in the IODF. Therefore, first of all, check the IODF and define all control-unit-to-port connections and port-to-CHPID connections if not already defined. If you do not define these connections, your resulting configuration diagram will be incomplete and you will get logical-physical inconsistencies (see “Receiving Visual Warnings” on page 43). It is recommended that you use the HCD ISPF dialog to define these connections in the IODF.

As already mentioned above, HCM relies on serial numbers to resolve ambiguities. Therefore, it is highly recommended that you provide serial numbers at least to those objects in the IODF for which those ambiguities can occur (see “Physical and Logical Objects in HCM” on page 55) and for point-to-point CTC connections. Note that you do not need to provide serial numbers for all objects.

You can add serial numbers to prepare the IODF in two ways:

1. Load the IODF as is into a config file, update the IODF using HCM, discard the config file, and then reload the IODF.
2. Use HCD to update the IODF before loading an HCM config file (see the *z/OS HCD User's Guide* for details).

The first method is probably the most effective way to prepare the IODF, and is the one we will describe here. The graphical feedback provided by HCM makes it easy to identify the objects that need work. The second method is appropriate only if your IODF is very large and requires only a few serial number changes to be made.

Load the IODF as described in “Loading the IODF” on page 61. Any physical information that requires updating will be immediately and visually obvious in the configuration diagram. This makes it easy to find and correct any problems. For example, in the following diagram, control units 1500 and 1520 are assigned to separate controllers because they have no serial numbers. After assigning them both the same serial number and reloading the IODF, both control units are assigned to the same controller.

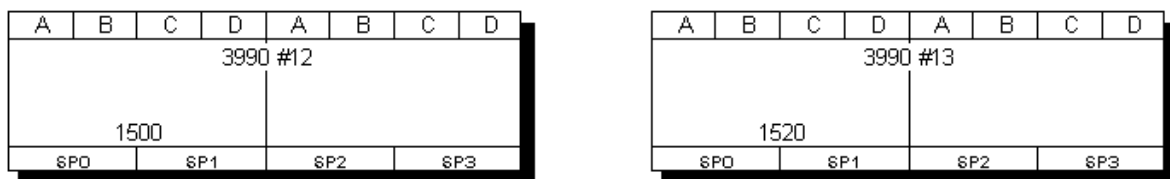


Figure 33. After loading the IODF in which control units have no serial numbers.

A	B	C	D	A	B	C	D
1500				1520			
3990 #12							
SP0	SP1		SP2	SP3			

Figure 34. After loading the IODF in which control units have the same serial numbers.

Don't be too concerned if the physical configuration diagram is wildly inaccurate at this point. Many of these problems will be corrected when you update the IODF using HCM in the next step.

Once this first load is complete, use HCM to update the IODF by adding serial numbers to logical objects that are part of the same physical object. Double-click on an object in the diagram to display its edit dialog, and edit the serial number for the object.

See "Physical and Logical Objects in HCM" on page 55 for an explanation of how HCM relies on serial numbers. Pay particular attention to I/O devices which have more than one device number (e.g. a device is known as 240 from System1 and 540 from System2).

**Tip:**

It is important to correct the initial physical configuration by updating the serial numbers. Once the logical objects have been placed into physical objects, they cannot easily be moved later.

The other thing you should do before reloading the IODF is review your need for physical description files. HCM comes with a number of PDF text files which you can use and/or modify, or you can create your own. You can then select which PDFs to apply to which controllers and strings. See Chapter 17, "Physical Description Files (PDFs)" on page 339 for more details. If you have "brand X" equipment, ensure that you have read and understood the "Graphical Representation of Physical Objects" on page 57. Controllers which have been assigned incorrectly to a PDF can always be changed later, but if most of your equipment is not well served by the installation-supplied defaults, you will find it easier to correct this *before* reloading the IODF.

After making your changes, save the config file. This implicitly saves the IODF. Then discard the config file by closing and deleting it. Reload the updated IODF into a new config file. Use the configuration diagram to check if your changes are correct. If the changes are not yet correct, change the IODF by providing the serial numbers to your logical objects again, and reload the updated IODF.

Then, you can modify the configuration in HCM, adding any desired physical information (see Chapter 6, "Modifying Objects in Your Configuration" on page 77).

## Loading the IODF

This step will load the IODF data set into a config file. If the config file already exists you will be requested to confirm that it is OK to completely overlay this existing config file.

Display the **IODFs** dialog by choosing **IODFs...** in the **File** menu. The **High-level Qualifier** dialog is displayed.

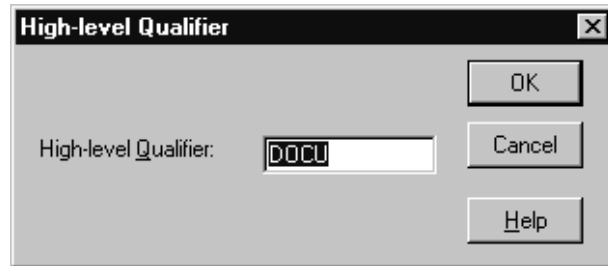


Figure 35. High-level Qualifier Dialog

Specify a high-level qualifier and click **OK**. The IODFs displayed in the list box in the **IODFs** dialog depend on the qualifier specified (see also "Specifying a High-Level Qualifier for z/OS" on page 62). The currently used high-level qualifier is always displayed below the **Qualifier...** button on the **IODFs** dialog. In the example in Figure 36 the high-level qualifier specified is "DOCU".

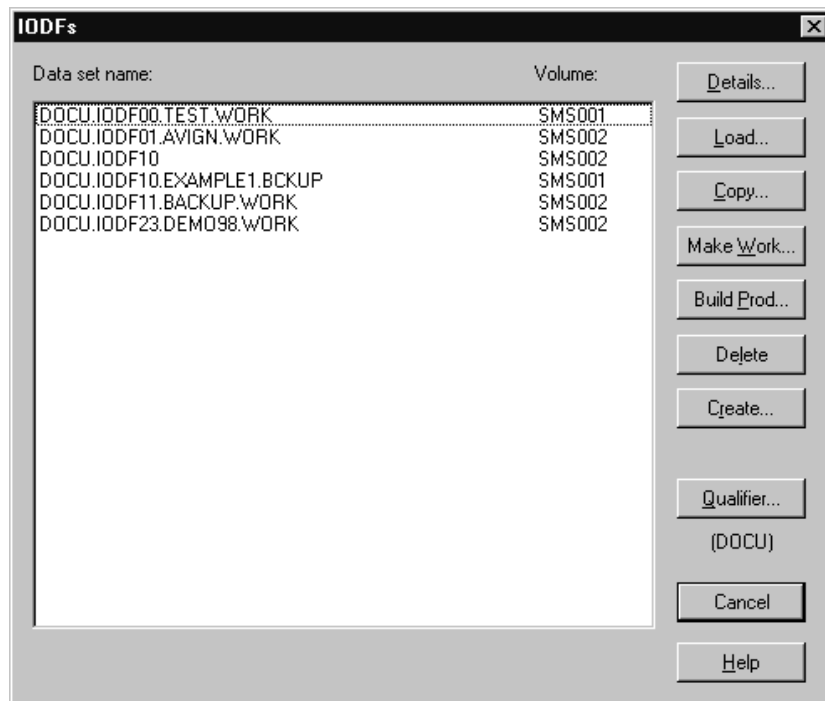


Figure 36. IODFs Dialog

Select the required IODF from the list of existing IODFs on the host, and then click on the **Load...** button to request the loading of the selected IODF configuration into the required config file.

Once the **Load...** function has started, the **Choose Local File** dialog is displayed (Figure 37). You are then taken through steps to select or create a config file and have it associated to the work IODF.

From the **Choose Local File** dialog check the HCM configuration directories selection, and change if required.

**Note:** For the first use of HCM, the default directory is usually the directory where the HCM product code resides (*drive:\IBMEEQ*).

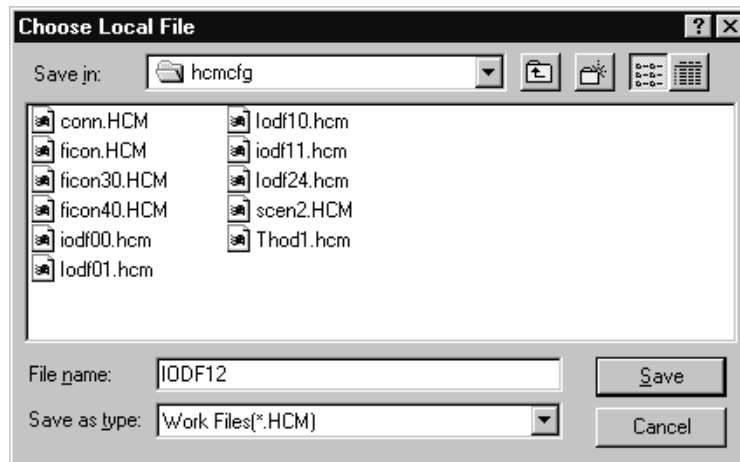


Figure 37. Choose Local File Dialog

To change the default config file directories selection, click on either the button

- In the Drives section and select the required drive or
- In the root directory and then a sub-directory entry from the selected drive.

The drive and directory name will be saved across HCM sessions.

#### Tip

If you specify an already existing config file name, you are requested to confirm (Yes/No) to replace the file. If you confirm with Yes, all currently stored information in the existing config file is completely overwritten.

Since the loading process involves reading all relevant connectivity data from the IODF in order to build the configuration diagram, it can take some time, especially for large IODFs.

### Specifying a High-Level Qualifier for z/OS

Click on the **Qualifier...** button in the **IODFs** dialog to open the **High-Level Qualifier** dialog. You can then specify the qualifier which determines the list of IODFs displayed in the **IODFs** dialog. The qualifier is the string of up to eight characters that precedes the first period in the dataset name. Changing the qualifier will display the list of IODFs beginning with that qualifier.

### Choosing Alternate Processor Definitions

If there is more than one processor defined in the IODF, HCM will ask you during the loading process whether the processors are physically separate or *alternate processor definitions* for the same processor.

The physical processor, known in HCM as the *machine*, can have multiple logical processors known as *shadows*. For example, a processor may be defined once in BASIC mode and once in LPAR mode. The *primary processor* in the machine is that which is in the current logical view; at IODF load time, machine connections are built for primary processors only. *Alternate* or *shadow processors* are those not in the current view; no physical connections are built for alternate processors at IODF load time. Every processor must be assigned to a new or existing machine. The name of the machine is the name of the primary processor.

During the IODF load (or resync) process, you can confirm or change which processors are assigned to which machines. The **Machines** dialog will automatically appear when there are new processors (added to the IODF on the host) which must be assigned to new or existing machines, or any time that some machine has more than one processor.

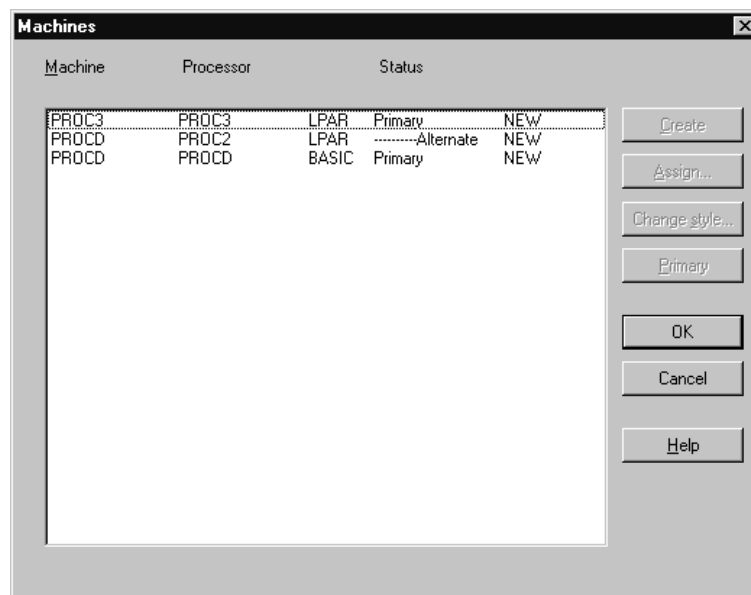


Figure 38. Machines Dialog

HCM will attempt to assign processors and primary / alternate status intelligently. The **Machines** dialog will ask you to confirm or change HCM's assignments; typically, you will press OK to confirm. For details on how to change HCM assignments, and how to manage shadow processors in general, see Appendix B, "Alternate Processor Definitions" on page 367.

After loading the IODF, the PWS config file and the IODF are saved automatically.

## Inspecting the Initial Configuration

The end result of the IODF load process is the creation of an initial configuration in a config file, using the logical data and serial numbers from the prepared and loaded IODF. At this point, you can take the time to examine the configuration for any inaccuracies caused by incorrect serial numbers:

1. Ensure that you have the correct number of physical processors in the diagram. If you do not, the serial numbers are incorrect. You must re-load the IODF with the correct processor serial numbers.
2. Ensure that all control units have been placed in the correct controllers. If there are control units in the wrong controllers, the control unit serial numbers are incorrect. The control unit cannot be moved into another controller. You can

either correct the serial numbers and re-load the IODF, or use HCM to delete the controller and control unit(s) and re-create and re-connect the control unit properly.

**Note:** Do not worry about control units being in the correct segments, or controller interfaces being attached to the correct cables at this point.

### Adding Physical Data to the Configuration

At this point, you have a configuration that is as accurate as possible from the data available in the loaded IODF. All necessary serial numbers are available. Proceed now with updating the physical data in HCM.

**Note:** After you have made any physical changes, do not load the IODF again, because a load replaces the existing config file and all physical data will be lost.

The updating of physical data is described on the following pages:

- Changing PDF assignments for controllers and strings (see “Graphical Representation of Physical Objects” on page 57 and Chapter 17, “Physical Description Files (PDFs)” on page 339).
- Moving control units between controller segments (see “Arranging Controller Components” on page 89).
- Ordering the interfaces on controllers and strings (see “Arranging Controller Components” on page 89).
- Ordering daisy-chained controllers and strings in the proper sequence on their cables (see “Connecting Objects” on page 128 and “Positioning Objects Along Daisy-Chained Connections” on page 128).
- Creating and connecting crossbar switches and fiber management cabinets (see “Crossbar Switches” on page 115 and “Cabinets” on page 118 and “Editing Fiber Links” on page 160 and “Connecting Crossbar Switches” on page 166).
- Importing physical objects, changing physical connectivity, updating descriptive fields in both the PWS file and the IODF, resynchronizing the PWS file and the IODF, (see Chapter 15, “Importing and Exporting Data” on page 283).
- Managing cables (see Chapter 8, “Physical Connections” on page 155).

After you have made physical changes, use the **Copy to Backup** command in the **File** menu to make a backup copy of your config file.

---

## Creating a New Configuration from Scratch

When building a configuration from scratch, you must create an empty IODF file as well as a new config file. From the **File** menu, choose **IODFs...** to display the **IODFs** dialog. Click on the **Create...** button to open the **Create IODF** dialog to create the new IODF on the host.

For z/OS, HCM follows TSO/E dataset naming rules. In addition, the IODF name must have the following format

hhhhhhhh.IODFcc.yyyyyyyy.yyyyyyy

where:

**hhhhhhhh**

is the TSO/E high level qualifier. If the name is enclosed in quotation marks then it must begin with a high-level qualifier. Otherwise, it must not and your user ID is used as the high-level qualifier.

**cc** is a set of any two hexadecimal characters (0..9 or A..F)

**yyyyyyyy**

are optional qualifiers.

You must allocate enough space for the IODF. The minimum work size is 16; the default is 1024, which will allow you to define at least 4000 devices, in general. This may **not** be changed later; if the configuration expands beyond this size, the IODF must be copied to a larger data set, using the **Copy...** button on the **IODFs** dialog (see “Copying an Existing IODF” on page 67).

After you have entered the information, press **OK** to create the new IODF. Now select the IODF and load it as described in “Loading the IODF” on page 61.

To populate a new config file with data from an existing IODF, see “Creating a New Configuration from an IODF” on page 58.

---

## Opening an Existing Configuration

If you are opening an existing configuration to edit, you can either:

- Open an existing config file and associated IODF, or
- Open an existing config file and an alternate IODF, and
- Upgrade earlier versions of configuration files.

### Opening an Existing Config File and Associated IODF

Choose the **Open...** command from the **File** menu. Select an existing config file to open from the list in the standard **File Open** dialog that appears. Note that HCM appends the file extension \*.HCM to your config file in case no extension is specified yet. HCM opens the config file against the particular IODF, checking to ensure they are in sync.

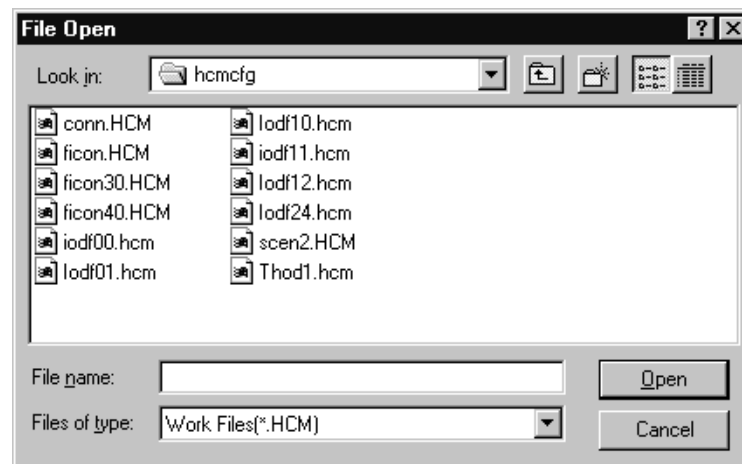


Figure 39. File Open Dialog

If the config file and IODF are out of sync, HCM will ask if you wish to open the config file anyway. Either the IODF has been replaced with an earlier or even unrelated IODF, or it has been updated on the host, outside HCM. If you open the config file, HCM will resynchronize; the config file will be altered to match the changed IODF.

## Opening an Existing Config File and a Different IODF

You can deliberately open a config file with an IODF other than the one associated with it. For example, you may wish to fix a mistake using an earlier IODF, or want to copy the IODF to a new (alternate) one with a larger allocated size. If the IODF has been renamed on the host, this feature allows you to open the config file against the renamed IODF.

Choose **Open Special...** from the **File** menu. The **File Open** dialog is displayed. Select a configuration file and click on **OK**. Then, the **High-level Qualifier** dialog is displayed where you can specify a qualifier which determines the list of IODFs to be displayed. Click on **OK**. The **Select an Alternate IODF** dialog is displayed. Select an IODF from the list and press **OK**. The config file is opened and resynchronized against the selected IODF.

## Upgrading Config Files

Using a config file created with an earlier version or service level of HCM can require an upgrade if you try to open this config file with a newer version of HCM. HCM applies an upgrade to both work configuration files and production configuration files. With HCM you can:

- upgrade the content of work and production configuration files (older \*.HCR and \*.HCM files are usable with newer versions or service levels of HCM)
- access the content of work and production configuration files as read-only (the \*.HCR and \*.HCM files are not upgraded)

HCM automatically detects whether a config file of an earlier version or service level needs to be upgraded for the use with the current level of HCM. The upgrade operation is indicated by the following dialog box:

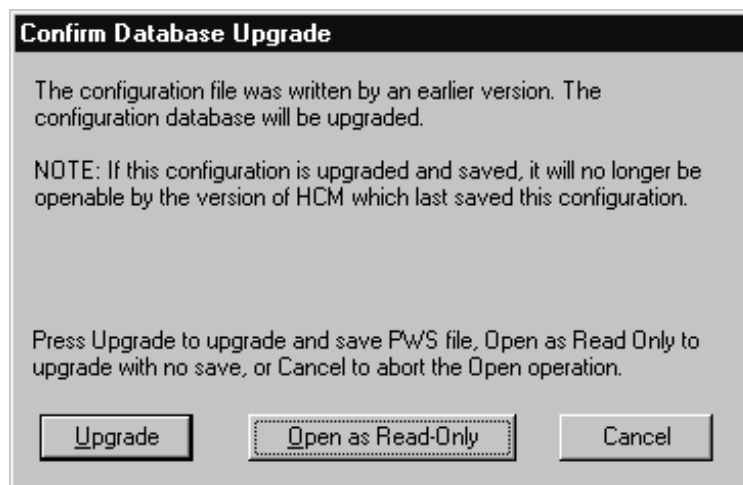


Figure 40. Confirm Database Upgrade

If you select the **Upgrade** button, HCM performs the upgrade operation and then saves the config file.

After the upgrade of the configuration to the new version or service level has been done, a resync of the configuration with the IODF is performed automatically.

If you select the **Open as Read-Only** button, the configuration file is not saved and you are not allowed to edit the config file - regardless whether a work or production configuration file is open.

**Note:** In case you want to continue to use your configuration file with an older version or service level of HCM, you must create a backup of it, which you can use in conjunction with the older version or service level of HCM.

---

## Working with Your IODFs and Configuration Files

This chapter explains how you can handle your IODF files with HCM.

### Copying an Existing IODF

Select an IODF from the list and click on the **Copy...** button in the **IODFs** dialog to open the **Target IODF** dialog. If you are copying to a new IODF file, type in the new IODF filename in the text field. If you are copying to an existing IODF file, HCM will confirm overwriting the file.

### Making a Work or a Production IODF

A *work IODF* can be modified and updated; it serves as your “working copy”.

A *production IODF* is used by IPL to build UCBs and EDTs. It is also used to build IOCDs and IOCP input data sets. Several users can view a production IODF concurrently and make reports of it, but it cannot be modified.

With the **IODFs...** dialog you can create work and production IODFs: either via the **Build Prod...** or the **Make Work...** action. These actions create a work or a production IODF but they do *not* create the associated work and production configuration files.

Building a work or production IODF via the **IODFs...** menu means, that the respective IODFs are created only (see “Create Work and Production IODFs Without the Associated Configuration Files”).

**Note:** We recommend that you should build a production IODF or work IODF together with the associated configuration file (see “Create Work and Production IODFs With the Associated Configuration Files” on page 68).

### Create Work and Production IODFs Without the Associated Configuration Files

To make a work IODF from a production IODF, click on the **Make Work...** button in the **IODFs** dialog. The **Create IODF** dialog appears, allowing you to create the work IODF. HCM deletes an existing IODF, and creates the new IODF.

To make a production IODF from a work IODF, click on the **Build Prod...** button in the **IODFs** dialog. The **Create Production IODF** dialog appears to allow you to create the production IODF.

When you make a production IODF, a “post-validation” is performed which might issue messages you have to deal with, according to their severity. The production IODF is not created if any errors with a severity higher than ‘warning’ are produced.

In order to use a production IODF for IPL and dynamic activate, its name must have the format, 'hhhhhhhh.IODFcc' where 'hhhhhhhh' is the high-level qualifier, up to 8 characters long, and 'cc' are any two hexadecimal characters. Optional qualifiers that are allowed for work IODFs must be omitted.

## Deleting an Existing IODF

Select an IODF from the list in the **IODFs** dialog, and click on the **Delete...** button. HCM will display a confirmation dialog prior to deleting the IODF.

## Copying Your Configuration

You can backup the config file and its IODF before making changes to them. Use the **Copy to Backup** command in the **File** menu to open the **Select Target IODF for Copy** dialog. You can either create a new file or select an existing file for the backup. HCM will make copies of the current files, leaving the original files open for you to continue working. If you have changed the IODF or config file, use the **Save** command in the **File** menu to save the changes before using the **Copy to Backup** function.

You can also copy the IODF to just increase the IODF file size.

## Create Work and Production IODFs With the Associated Configuration Files

Building a work or production IODF using the **Build Production...** or the **Make Work...** function of the **File** menu means, that the associated configuration files are also created.

To make a production IODF from a work IODF select **File** from the menu and then select the **Build Production...** action.

Two dialogs appear. The first one is **Create Production IODF** followed by **Save Production File**.

HCM checks whether the target IODF exists on the host. If it already exists, HCM deletes the existing IODF and proceeds with the **Create Production IODF** operation.

The following results may occur when the **Build Production...** action is performed on the host. The first two results indicate that the operation was performed successfully.

### SUCCESS

No warnings or errors. The \*.HCR file is to be saved under the name supplied in the **Save Production File** dialog.

### SUCCESS WITH WARNINGS

No errors. You can view the warnings. HCM continues with the **Save Production File** dialog. If you do *not* want to continue, the production IODF is still available. There is *no* automatic deletion of the IODF.

### ERROR

No production IODF has been created. You can view the error and warning messages.

If the production IODF is successfully created, HCM displays the **Save Production File** dialog. The \*.HCR file is saved under the name supplied in the **Save Production File** dialog.



Figure 41. Save Production File Dialog

In the Save Files of Type combination box you can select between Prod Files (\*.HCR) and All Files (\*.\*).

When saving a production configuration file, you can specify the path in the Directories and Drives section, the file name in the File Name section, and the file type in the Save File as Type section. The defaults are:

- Path** The same path as for the \*.HCM file, based on the last used directory.
- File Name** The same file name as for the \*.HCM file name.
- File Type** \*.HCR (If no extension is specified, the default will be used.)

To make a work IODF from a production IODF, select **Make Work...** from the **File** menu. Two dialogs appear. The first one is **Create IODF** followed by **Save Work File**.

You can reach the **Create IODF** dialog from various menus. The following description is for the path via the **Make Work...** action.

HCM checks whether the target IODF exists on the host. If it already exists, HCM deletes the existing IODF and proceeds with the **Create IODF** operation. If the work IODF was successfully created, HCM displays the **Save Work File** dialog.

When saving a work configuration file, you can specify the path in the Directories and Drives section, the file name in the File Name section, and the file type in the Save File as Type section. The default extension is \*.HCM.

## Naming Convention of Your Configuration Files and IODFs

Normally, a given production IODF will repeatedly go through a cycle of being converted into a work IODF so that it may be altered, then converted back into a production IODF for use in the production environment. A standard naming convention for PWS files and IODFs which are part of this cycle can simplify administration. For instance, one possible convention would assign to each

production IODF a name that has an ever increasing version number. In an HCM environment, that IODF would be paired with, for example, a IODF92.HCR file on the PWS. When IODF92 requires modification, a work IODF and a work PWS file are generated. The IODF receives the name IODF93.WORK and the PWS file receives the name IODF93.HCM. Once the changes are made, new production versions are built with the names IODF93 and IODF93.HCR.

## Deleting a Configuration File

You cannot delete a configuration file together with its associated IODF with one function in HCM. You can delete them separately.

## Saving and Closing Your Configuration

The **Save** command in the **File** menu explicitly copies the config file from memory to disk, but keeps it in memory so you can keep working. The **Save** command also saves the IODF, and tags the config file and IODF with matching tokens.

The **Close** command saves both the IODF and the config file, then closes both files. When you close the IODF with **Close** or **Exit**, the **Activity Log** dialog will appear if activity logging is enabled for the IODF.



Figure 42. Activity Log Dialog

HCM allows you to add a message to the activity log. Use the HCD dialog to view the complete activity log.

You must close an open config file before you can choose **IODFs...**, **Open...**, or **Open Special...**. **Exit** performs a **Save** before exiting.

If HCM terminates because of a host abend, a loss of network connection, or an HCM abend, then the next time you open your config file HCM may need to resynchronize it with the IODF. Furthermore, whether a resync is required or not, the last modification made before the termination may need to be made again.

---

## Chapter 5. Standalone Mode

In addition to the HCM online mode of operation where you have a connection to your host, HCM offers the standalone mode. In this mode, you can open a configuration file *without* a host connection. The standalone mode extends the scope of HCM with a view to mobility and problem situations.

In standalone mode you can open both work and production configuration files. The production configuration file contains the complete IODF information, therefore, you can view the data associated with that configuration even if the host is not available. In this case you can use HCM as a browser for the configuration, but you cannot update any data (read-only mode).

If the configuration file is a work configuration file, its physical data (excluding connections) can be edited. This allows you to gather cable information, VOLSERS, user data fields, and other information for example, in the machine room floor while editing the configuration on a portable workstation. In the work configuration file, you can shuffle control units between physical controller segments and move devices from one unit in a string to another unit. This is possible as long as the logical definitions are not affected.

---

### Invoking the Standalone Mode

To invoke the standalone mode select the **Standalone** button on the **Login** dialog window. As a prerequisite, your configuration file must reside on a resource on the workstation (or accessible from the workstation).

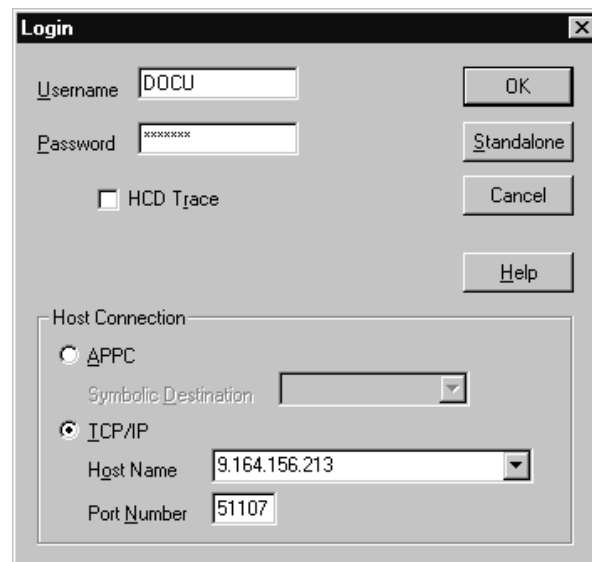


Figure 43. Login Dialog

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### Working with the Standalone Mode

The standalone mode disables all actions within a configuration which:

- Require a connection to the host.

- Are related to objects and relations not stored in the work configuration file. Refer to “Work Configuration File” on page 73.
- Require a resynchronization between the IODF and the configuration file.

If you work with the standalone mode, the most obvious deviation from the online mode are the following disabled menu choices:

*Table 3. Disabled Menu Choices*

File	Edit	Create	Options
Open Special... Copy to Backup... Build Production... Make Work... <sup>1</sup> IODFs... Import Data ... <sup>2</sup>	OS Configurations ... <sup>1</sup>	Processor... Switch... Crossbar Switch... Controller... String... CTC Connection... CF Connection Cabinet ... <sup>2</sup>	Activate HCD Trace

The menu bar choices **Operations** and **Utilities** are also not available.

## Creating Objects

Most operations to create objects in standalone mode are not allowed because they imply the creation of at least one logical IODF object. For instance, HCM does not provide a means of creating an empty controller. At least one CU is always created. Therefore, the creation of empty strings and empty controllers is not supported in standalone mode.

The only creation operation which is allowed is the creation of cabinets. Cabinets are physical objects. Physical objects may be connected and disconnected. The connection and disconnection of logical objects is not allowed.

## Viewing Objects

You can view detailed information when you select **Edit** from the menu.

## Printing Reports, Diagrams, Cable Labels

You can print reports, existing diagrams, and cable labels in standalone mode for work and production configuration files. The following table illustrates which kind of report may be printed from which configuration file:

1. These actions are disabled when a work configuration file is opened.

2. These actions are disabled when a production configuration file is opened.

Table 4. Printing of Reports

Type of printing	*.HCM file	*.HCR file
Report	No <sup>3</sup>	Yes
Existing diagrams	Yes	Yes
Cable labels	Yes	Yes

## No Host Connection

Regardless of whether a work or a production configuration file is open, any action that requires a host connection, produces the message EEQ0212E:



Figure 44. Message EEQ0212E

## Work Configuration File

If the open file is a work configuration file, HCM is not able to report or display certain data because the data is not present in the work configuration file. This data is only stored in the IODF on the host. In detail the following information is *not* available in standalone mode:

- Switch and port configurations
- Operating system related data
- Logical data of control unit-processor definitions
- Logical data of device-processor definitions

## Production Configuration File

Within an opened production configuration file you cannot modify the physical and logical data. The production configuration file is read-only.

**Note:** Some data can only be displayed after selecting the **Edit** button in the appropriate dialogs even if the production configuration file is read-only.

You can use the standalone mode in combination with production configuration files in your enterprise for online documentation of the configuration because you can distribute the files electronically or you can place it on a central LAN resource for common access.

## Upgrading

If HCM is running in standalone mode, the upgrade operation is not possible: upgrading requires a host connection.

3. Report printing requires some data which is available only from the host or from production configuration files.

## Resynchronizing

If HCM is running in standalone mode the resynchronization operation is not possible.

## VOLSER Reconciliation

Before the introduction of OS/390 1.3.0 HCD, VOLSER data could be stored in HCM configuration files, but not in the IODFs. Since the introduction of OS/390 1.3.0 HCD, however, IODFs now contain VOLSER data, and there might be a mismatch between the VOLSER data in an HCM configuration file and its corresponding IODF on the z/OS host if you have updated VOLSER data in the HCM configuration in standalone mode.

The next time you open your configuration file in HCM in online mode by using **Open...** or **Open Special...** from the **File** menu, differences between the VOLSERs stored in your HCM configuration file and those stored in the IODF will be detected. These differences must be unified, or reconciled, and so HCM will present the **VOLSER Reconciliation** dialog to resolve the differences before displaying the configuration diagram.

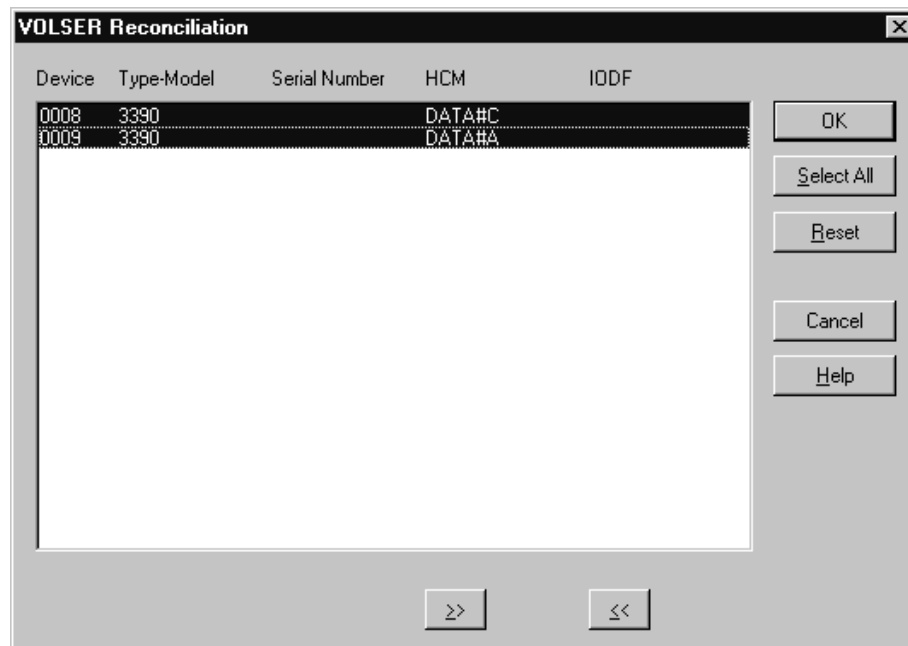


Figure 45. VOLSER Reconciliation Dialog

The listbox contains one line for every device in the configuration for which the VOLSER value in the IODF on the z/OS host and the associated configuration file on the PWS differ. On entry, all lines are preselected. But you can also work with only one or several devices by clicking on the appropriate lines.

Each line of the listbox shows the device ID, the device type and model, the serial number, and the VOLSER values for the configuration file and the current VOLSER recorded in the IODF on the host.

You can process the selected lines in the listbox as follows:

- Click the button with the >> symbol to accept the HCM VOLSER value for the selected device. This button symbolically sets the direction of the VOLSER transfer for the selected lines and copies the HCM VOLSER values into the IODF.
- Click the button with the << symbol to reject the HCM VOLSER value for the selected device. This button symbolically sets the direction of the VOLSER transfer for the selected lines and copies the IODF VOLSER values into the HCM configuration file.

Once a line has been processed, the selected lines are grayed and a >> or << symbol is inserted between the HCM VOLSER value and the IODF VOLSER value.

To unprocess your selection you can use the **Reset** button to mark all the lines in the listbox as requiring processing again. The lines can now be reprocessed again.

When you have processed every item in your listbox, click on the **OK** button. HCM then updates the local and/or the remote database with the accepted VOLSER changes.

**Note:** HCM offers a "Prime the IODF with Sensed Data" utility in the Utilities menu. Using this utility, sensed data can be stored in the IODF. See "Priming the IODF with Sensed Data" on page 172 for details.



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## Chapter 6. Modifying Objects in Your Configuration

Once you have built your initial configuration, you can modify objects in the HCM config file. This section explains how to manipulate all the elements of your hardware configuration with the interactive configuration diagram and dialogs. After you have edited objects in the diagram, you can connect (or disconnect) them, see Chapter 7, “Connecting Objects in Your Configuration” on page 127.

**Note:** Status information is available only with I/O Operations for z/OS.

---

### Processors

You can create, edit or delete processors by calling up the appropriate dialogs for the desired processor object in the configuration diagram. Double-clicking on a processor object displays the **Processor** dialog to make further definitions for partitions and CHPIDs. Alternatively, choose **Processor...** from the **Edit** menu and select the processor name from the list that appears. Note that you can rearrange and filter the list according to your needs.

The **Processor** dialog displays detailed information for the selected processor and the associated system. It allows you to navigate to other related dialogs. You can add or edit partitions, CHPIDs, the processor details or check the system status (only active when online and in BASIC mode and when I/O Operations is up and running) by pressing the appropriate button.

You can also change a processor’s style, make it a primary or alternate processor, or assign processors to machines during IODF load / resync. See Appendix B, “Alternate Processor Definitions” on page 367.

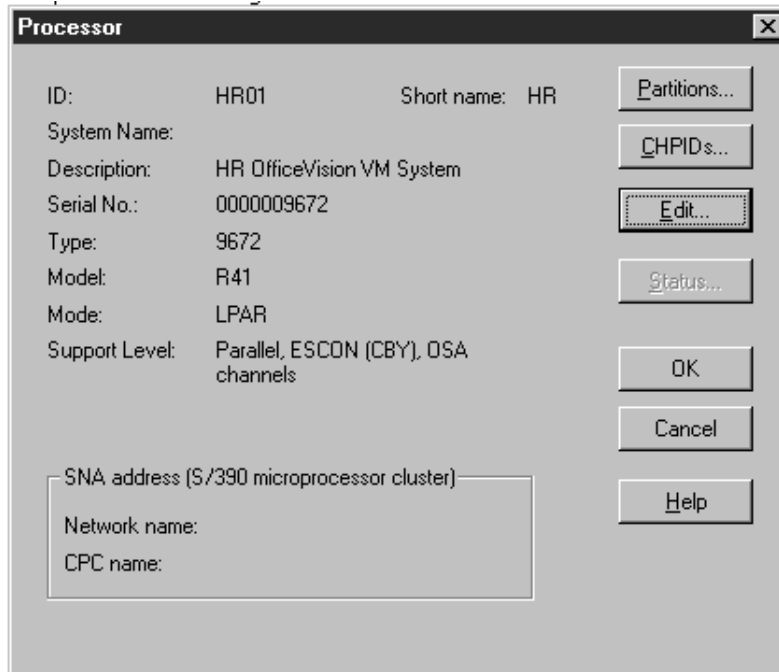


Figure 46. Processor Dialog

## Creating a Processor

Display the **Create Processor** dialog by choosing **Processor...** from the **Create** menu. Type in the fields or select data from the drop down boxes. The ID and Type / Model are the only required fields. Note that Type / Model is a single field; you can select a type and model from the drop down box or type in the field. After you have filled in the information, press **OK** to create the new processor, which will appear in the configuration diagram. You can then double-click on the processor to display the **Processor** dialog (see Figure 46).

Note that the **Short name** of a processor is part of the physical machine.

### Tip:

To create another processor for “one processor per partition” processors, use the **Create...** button in the **Processors** dialog. (Display the **Processors** dialog by choosing **Manage Shadow Processors...** from the **Edit** menu.) See “Managing Shadow Processors During an HCM Session” on page 367 for details.

## Choosing a Support Level

If there is more than one support level for the type and model of processor that you specify in the **Create Processor** or **Edit Processor** dialog, the **Choose Support Level** dialog appears when you press **OK**. Select the support level for the selected processor and press **OK**. Selecting the correct support level is important for validation processing, as the support level controls the rules that apply to the processor (for example, the number of CHPIDs).

## Editing a Processor

Click on the **Edit...** button in the **Processor** dialog to display the **Edit Processor** dialog. You can then add or edit processor information and press **OK**. The changes will appear in the **Processor** dialog's list box. If there is more than one support level for the type and model of processor specified, the **Choose Support Level** dialog appears with the current support level highlighted when you press **OK**.

If you change the type, model or support level of the processor, you may have to renumber the CHPIDs. For example, if you change the processor type from one with 64 CHPIDs to one with 128, the CHPIDs which were originally divided equally between the two sides of the processor (32 on side A and 32 on side B) will now appear all on one side (64 on side A). You may wish to renumber the CHPIDs such that the original 64 CHPIDs plus the extra new 64 CHPIDs are divided equally between the two sides. HCM will propose new CHPID numbers as appropriate for the new CHPIDs.

If you have changed the Type/Model or Support Level, pressing **OK** in the **Edit Processor** dialog will display the **CHPID Renumbering** dialog, allowing you to renumber the CHPIDs as required.

### Adding User Data to a Processor

Add or edit user data by pressing the **Info...** button in the **Edit Processor** dialog to display the standard user data dialog. For more details, see "User Data Fields" on page 31.

## Deleting a Processor

Select the processor object in the configuration diagram and press the DEL key. HCM will display a confirmation dialog before deleting the processor.

You can also delete processors in the **Processors** dialog, called by choosing **Manage Shadow Processors...** from the **Edit** menu. Select a logical processor in a machine and press the **Delete** button. HCM will display a confirmation dialog, then delete the processor, provided that it is not the last one within the machine. The primary and alternate settings are adjusted for the remaining processors in the machine. See Appendix B, "Alternate Processor Definitions" on page 367.

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## Partitions

Once you have created a processor, you can add and modify its partitions. First select a processor by double-clicking on the processor object in the configuration diagram; alternatively, choose **Processor...** from the **Edit** menu and select the processor name from the list that appears. Display the **Partitions** dialog for the processor by clicking on the **Partitions...** button in the **Processor** dialog.

The list box in the **Partitions** dialog lists all partitions for the selected processor. You can create a new partition for the processor, or select a partition to edit or delete it.

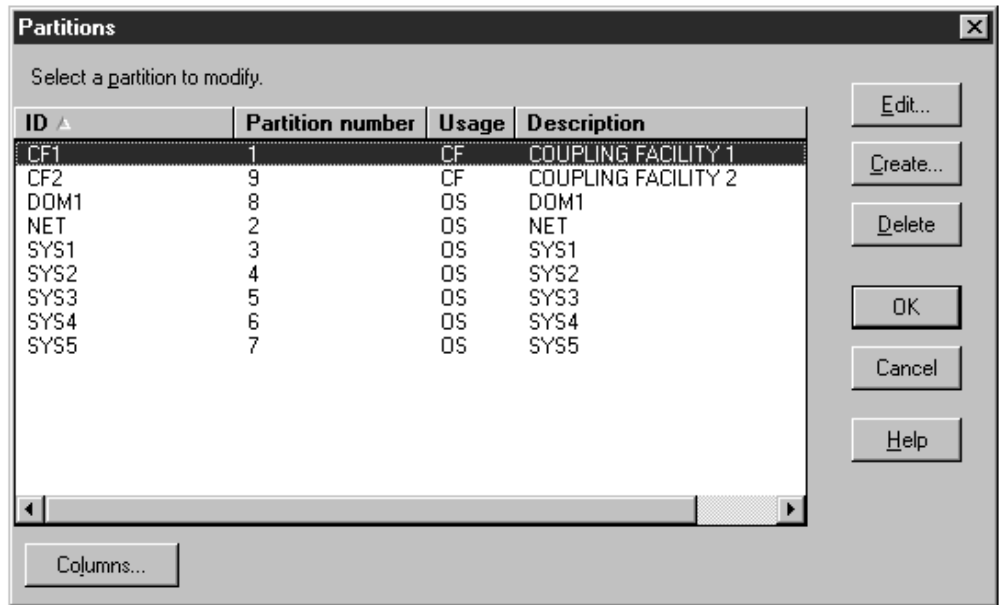


Figure 47. Partitions Dialog

## Creating Partitions

You can create a new partition for the selected processor. Click on the **Create...** button in the **Partitions** dialog to display the **Create Partition** dialog. Enter the information defining the partition and press **OK**. The partition will appear in the **Partitions** dialog list box and as an object within the processor in the configuration diagram. Note that the Usage option determines if the partition will be used solely for standard operating system connections (OS), as a coupling facility (CF), or both (CF/OS).

After creating one or more partitions, they can be assigned to the access and candidate lists of CHPIDs. See “Assigning CHPIDs to Partitions” on page 85 for more information.

### Granting I/O Devices Access to the New Partition

If there are already I/O devices connected to the processor containing the new partition, pressing **OK** in the **Create Partitions** dialog will display the **I/O Devices with Explicit Candidate Lists** dialog. You can select the I/O devices which should be granted access to the new partition before HCM creates the partition.

Note that you can display serial numbers and VOLSERS, device descriptions, or control unit numbers in the last column of the device list box by clicking one of the option buttons in the View section.

## Editing a Partition

You can edit a partition in different ways:

- In the **Partitions** dialog select a partition and click on the **Edit...** button to open the **Edit Partition** dialog for the selected partition.
- Double-click on the partition object within the processor in the configuration diagram.

- Choose **Partition...** from the **Edit** menu and select the partition name from the list that appears. Note that you can rearrange and filter the list according to your needs.

Edit the partition data in the fields and press **OK**.

The **Status** button allows you to retrieve information about this partition and to check system status.

### Adding User Data to a Partition

Add or edit user data by pressing the **Info...** button in the **Edit Partition** dialog to display the standard user data dialog. For more details, see “User Data Fields” on page 31.

## Deleting a Partition

Select a partition from the list box in the **Partitions** dialog and click on the **Delete** button. HCM will display a confirmation dialog before deleting the partition. Note that you cannot delete a partition directly from the configuration diagram.

## CHPIDs

Channel path IDs or CHPIDs can be added or modified once you have created a processor. First display the **Processor** dialog by double-clicking on the processor in the configuration diagram, or by choosing **Processor...** from the **Edit** menu and selecting a processor from the list box that appears. Then click on the **CHPIDs...** button in the **Processor** dialog to display the **CHPIDs** dialog.

The list box in the **CHPIDs** dialog shows all CHPIDs for the selected processor.

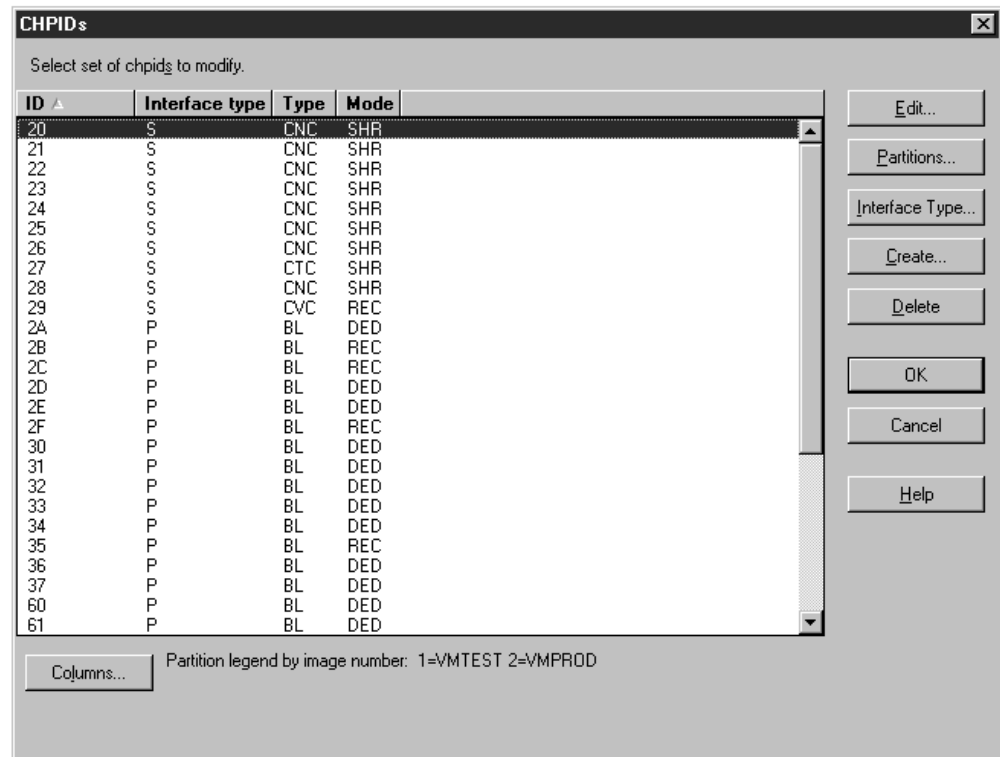


Figure 48. CHPIDs Dialog

Display either CHPID descriptions or partition assignments in the list box by

choosing one of the option buttons in the View section. You can create or delete CHPIDs for a processor. You can select one or more CHPIDs to view details or assign to partitions.

There may be four special cases of CHPID text displayed in the list box, for example:

ID	Interface type	CHPID type	Access mode	
AC	S	CNC	SHR	<i>Normal case</i>
AC*		CNC	SHR	<i>CHPID without a physical channel</i>
AC*	S	–	–	<i>Physical channel without a CHPID (CHPID Type and Access Mode are blank)</i>
AC/32	S	CNC	SHR	<i>A CHPID mapped to Channel 32 (only appears on “one processor per partition” machines)</i>

## CHPID Interface Type

The (physical) interface type is independent of the (logical) CHPID type, and does not always match (physical-logical inconsistency). To correct inconsistencies, either change the CHPID type in the **Edit CHPID** dialog (press the **Edit...** button in the **CHPID**s dialog), or change the interface type in the **Change Path Interface Type** dialog (press the **Interface Type...** button in the **CHPID**s dialog).

Crossbar switch interfaces are always parallel. ESCON or FICON switch interfaces (ports) are always serial. CHPIDs can be any of the five path interface types. Controller channel interfaces can be parallel, serial, IOC or OSA. Note that converters can only convert between parallel and serial; interfaces of the type coupling, IOC or OSA can only connect to each other.

Changing between serial and parallel interface types can usually be done while the interface is connected; converters will be inserted or removed as appropriate.

### CHPID Access Mode

The *access* mode determines how CHPIDs are assigned to partitions. A CHPID can be dedicated (DED), reconfigurable (REC) or shared (SHR). A *dedicated* CHPID is assigned to one partition; only that partition can access I/O devices on this CHPID. A *reconfigurable* CHPID is an unshared CHPID that you can reconfigure off-line from one partition, then on-line to another (for example, after a power-on reset). Only one partition can access I/O devices on this CHPID at a time. A CHPID that can dynamically access more than one partition is a *shared* CHPID; one or more partitions can access I/O devices at the same time using this CHPID.

## Unmanaged/Managed CHPIDs

HCM supports the definition and visualization of manageable channel paths. Dynamic Channel Path Management is a capability designed to dynamically adjust the channel configuration in response to shifting workload patterns. It automatically adds and removes I/O paths to disk control units in an attempt to provide the most effective resource utilization from the available hardware and configuration. It also coordinates these changes across the systems that share the paths eligible to be reconfigured.

When you define a CHPID as managed, you have to click the **Managed** checkbox on the **Create CHPIDs** dialog and specify an I/O Cluster when the processor is running in LPAR mode.

## Partition-to-CHPID Access Symbols

On the diagram, access from a partition to a CHPID is represented by a symbol at the intersection between the CHPID's column and the partition's row. The symbols represent the CHPID's mode (DED, REC, or SHR) and whether the partition is in the CHPID's access list or its candidate list.

Cand	Access	
	■	Dedicated (DED)
□	▣	Reconfigurable (REC)
○	⊙	Shared (SHR)

Figure 49. Partition-to-CHPID Access Symbols

## Selecting a CHPID to View Details

Select one or more CHPIDs in the **CHPIDs** dialog and press the **Edit...** button. Alternatively, double-click on a CHPID in the configuration diagram. The **CHPID** dialog will open, displaying the details for the selected CHPID, including ID, description, type, mode, and to what objects the CHPID is connected. If you have selected more than one CHPID, pressing **OK** will cycle through each CHPID's details. You can then edit the CHPID or assign it to one or more partitions.

The **Status** button leads you to the **CHPID status** dialog.



Figure 50. CHPID Dialog

## Editing Objects Connected to a CHPID

The **CHPID** dialog lists the objects connected to a selected CHPID. If you choose the **Physical** option in the **View** section, select an object, and press the **Edit**

**Object...** button, the **Edit** dialog for that physical object will open. That is, select a controller to open the **Controller** dialog; select a crossbar switch to open the **Edit Crossbar Switch** dialog; or select a switch to open the **Switch** dialog.

If you choose the Logical option in the View section, select an object, and press the **Edit Object...** button, the **Edit** dialog for that logical object will open. Select a control unit to open the **Control Unit List** dialog, or select a CTC connection to open the **CTC Connection** dialog.

### Ordering Objects Connected to a CHPID

From the **CHPID** dialog, press the **Order...** button. This opens an order dialog, allowing you to change the order in which objects are daisy-chained on this CHPID.

## Adding CHPIDs to a Processor

You can create new CHPIDs for a selected processor. Click on the **Create...** button in the **CHPIDs** dialog to open the **Create CHPID** dialog. Enter the CHPID information; you typically create a range of CHPIDs with the From and To fields. If a switch is already defined in the configuration, you can indicate the dynamic switches in the **Create CHPID** dialog. Once you have created CHPIDs, they will appear in the **CHPIDs** dialog list box and as objects within the selected processor in the configuration diagram.

## Editing a CHPID

You can edit a CHPID's details in different ways:

- Select one or more CHPIDs and press the **Edit...** button in the **CHPIDs** dialog to open the **CHPID** dialog. If you have selected more than one CHPID, you can cycle through each CHPID's details by pressing **OK**, until you find the one you wish to edit.
- Double-click on the desired CHPID in the configuration diagram.
- Choose **CHPID...** from the **Edit** menu and select the CHPID name from the list that appears. Note that you can rearrange and filter the list according to your needs.

In the following **CHPID** dialog press the **Edit...** button to display the **Edit CHPID** dialog.

Note that changing the CHPID type (logical) in this dialog does not automatically change the interface type (physical). If you change the CHPID type such that the interface type is no longer consistent, you must update the interface type with the **Change Path Interface Type** dialog to avoid a physical-logical inconsistency (see "CHPID Interface Type" on page 82 for more details). Note that you can change the CHPID type while the CHPID is connected.

When you change the CHPID type from one a type corresponding to a parallel interface (BL, BY) to a type corresponding to a serial interface (CNC, CTC, CVC, CBY), or if you change the access mode to or from shared (SHR), you must change all other CHPIDs on the same processor that are connected to common control units. In this situation, the **CHPIDs To Be Updated** dialog will appear to allow you to change these CHPIDs at the same time.

For a CHPID that is connected to a controller through a switch, this dialog allows you to enter a two digit hex number for the connected switch. The Dynamic Switch drop down box only lists those switches that are physically reachable,

either directly or via one chained switch. If the CHPID is connected directly to a controller, this list is empty. See “Connecting Switches to Processors or Other Switches” on page 142 for more details.

## Deleting a CHPID

Select one or more CHPIDs from the list box in the **CHPIDs** dialog and click on the **Delete** button. HCM will display a confirmation dialog before deleting the CHPID(s). Note that you cannot delete a CHPID directly from the configuration diagram.

## Assigning CHPIDs to Partitions

CHPIDs are assigned to partitions in a processor by adding each partition to the CHPID’s Access or Candidate list. Each CHPID has two partition lists, Access and Candidate: if a CHPID is either shared or reconfigurable, you can specify which partitions have access to that CHPID, and which are only “candidates” for access. Use the CHPID Access list with or without the CHPID Candidate list.

You can use the **Assign Partitions** dialog to assign partitions to a selected CHPID(s). Only CHPIDs with the same initial Mode, and Access and Candidate lists may be selected and assigned partitions at the same time.

To display the **Assign Partitions** dialog, select one or more CHPIDs in the **CHPIDs** dialog and press the **Partitions...** button. Alternatively, press the **Partitions...** button in the **CHPID** dialog. Use the **Add>>** and **<<Remove** buttons to assign partitions to the CHPID Access or Candidate list.

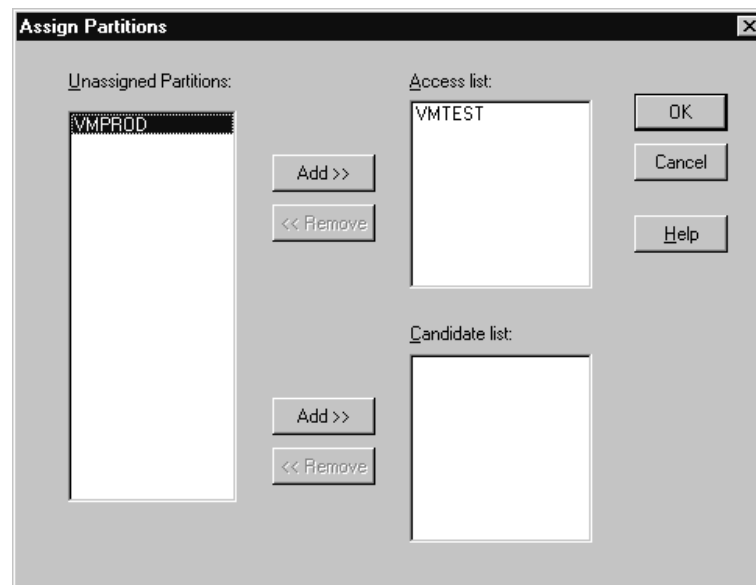


Figure 51. Assign Partitions Dialog

## Aggregating CHPIDs

If you need to combine attachments of several CHPIDs onto a single CHPID within the same processor, HCM offers you the **Aggregate CHPID** wizard under the **Utilities** menu. All CHPIDs must be connected to the same switch and use the same dynamic switch. See Aggregating CHPIDs on page 171 for a description of this wizard.

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## Controllers

You can create, edit or delete controllers by calling up the appropriate dialogs for the controller object in the configuration diagram. You can also physically connect and logically define controllers to processors; once the connection is made, you can add physical objects to it, such as patchports, crossbar switches, converters or switches.

There are different possibilities to open the **Controller** dialog:

- Double-click on a controller in the configuration diagram.
- Choose **Controller...** from the **Edit** menu, and select the desired controller from the list which appears. Note that you can rearrange and filter the list according to your needs.
- Press the **Controller...** button in the **Edit Switch** dialog, to edit the switch control units and devices. See “Editing Switch Port Attributes” on page 110 for more details.

The **Controller** dialog lists all channel interfaces and their connections for the selected controller. You can access related dialogs to edit the controller or list the control units it contains.

You can also select a channel interface to connect to a target, edit the fiber link for a connection, or change the type of a channel interface.

Note that when you select a channel interface to connect to a target, pressing the **Connect...** button begins the process of connecting the controller and one or more processors. The **Connect Channel Interface** dialog which appears leads to other dialogs which allow you to create any necessary logical definitions for the physical connection. See “Connecting Controllers to Processors” on page 135.

The **Controller** dialog also lists any strings/devices connected to the controller through its device interfaces. If I/O devices have no physical string (they are *integrated* into the controller), the “virtual strings” containing them are displayed (see “Editing a Controller” on page 88). You can select a string to edit, or create a string under the selected controller. See “Strings” on page 97 for more information.

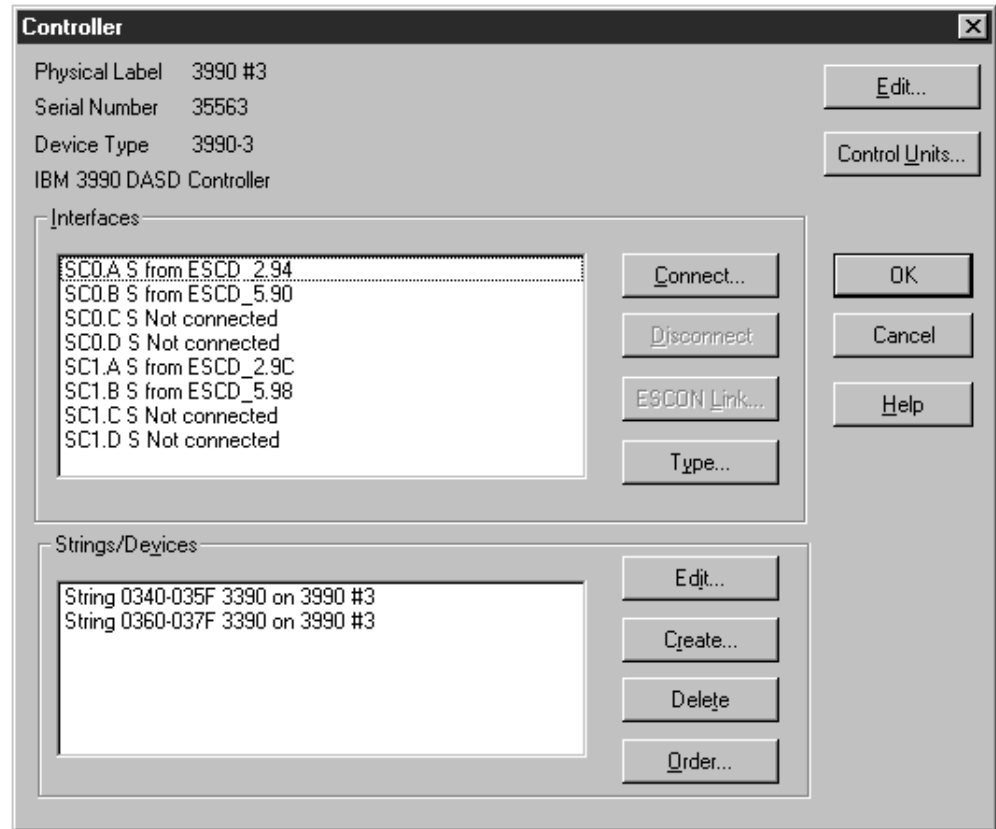


Figure 52. Controller Dialog

## Creating a Controller

To create a new controller, open the **Create Controller** dialog by choosing **Controller...** from the **Create** menu. Enter the information for the controller and press **OK**.

If there is more than one physical description of the control unit type, the **Choose Physical Description** dialog will be opened.

If the physical description for the controller has more than one segment, the **Add Control Unit** dialog will be opened for you to create control units for the other segment(s).

The controller object will appear in the configuration diagram.

After creating the controller, you can edit it and connect its interfaces to objects, using dialogs accessed through the **Controller** dialog. Additional control units may be added to the controller through the **Create Control Unit** dialog.

## Choosing a Physical Description

The physical description file, or *PDF*, is a template associated with the controller or string that describes its physical characteristics. See Chapter 17, "Physical Description Files (PDFs)" on page 339 for more details.

In the **Create Controller** dialog, if the control unit type selected has only one possible physical description, then HCM simply creates the controller when you press **OK**. If the control unit type selected has more than one possible physical description, pressing **OK** causes the **Choose Physical Description** dialog to automatically appear. (You can deliberately open this dialog; see “Editing a Controller”). Select a physical description and press **OK** to create the new controller.

Changing the physical description affects all controllers within a subsystem (e.g. dual frame); you may only change to a physical description for a subsystem with the same or fewer number of components.

### **Adding Control Units to Controller Segments**

If you are creating a controller with more than one segment in the **Create Controller** dialog, pressing **OK** will display the **Add Control Unit** dialog to allow you to create control units for the second (and subsequent) segment. You need only enter the control unit number and description; the serial number and type will be copied from the control unit in the first segment.

### **Ordering Strings Connected to the Controller**

In the **Controller** dialog press the **Order...** button in the Strings/Devices section. This opens an order dialog, allowing you to order the strings for a selected device interface. If there is more than one device interface on this controller, a dialog will be opened for you to choose on which device interface you want to re-order strings.

## **Editing a Controller**

Click on the **Edit...** button in the **Controller** dialog to open the **Edit Controller** dialog. Edit the information for the selected controller, or access related dialogs to add user data, change the physical description, arrange components within the controller, or group controllers into subsystems (for example, dual frame).

Note that if the Physically Installed check box is not enabled, the controller is un-installed, and drawn with dotted lines in the configuration diagram.

If the Devices are Integrated check box is enabled, all strings connected to the selected controller are integrated into the controller. Integrated strings and devices are not drawn in the configuration diagram, but can be accessed through the **Edit** menu or the Strings section of the **Controller** dialog. When you first create a controller, if its type is anything except DASD or Tape, it will be automatically marked as “devices are integrated”.

The Display Class list box allows you to select a display class of the subsystem to which the controller belongs. The display class only affects the display by HCM of certain classes of controllers; the display class is initially set by HCM during IODF load/resync according to the first control unit added to the subsystem (see “Filtering Your View” on page 35 for details).

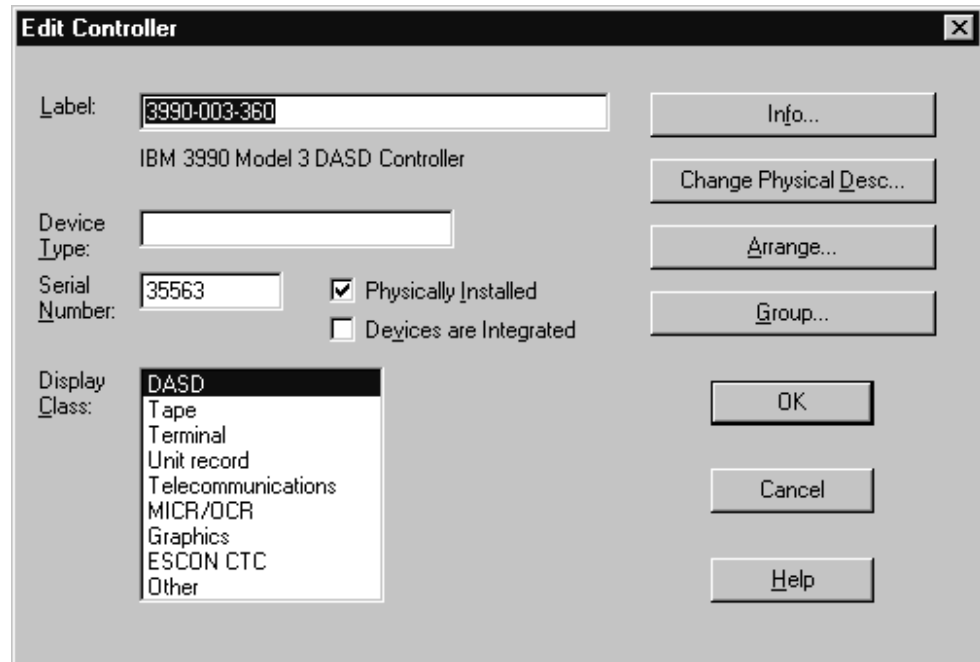


Figure 53. Edit Controller Dialog

### Adding User Data to a Controller

Add or edit user data by pressing the **Info...** button in the **Edit Controller** dialog to display the standard user data dialog. For more details, see “User Data Fields” on page 31.

### Choosing a Physical Description

You can change the physical description of a selected controller by pressing the **Change Physical Desc...** button in the **Edit Controller** dialog. The **Choose Physical Description** dialog appears to allow you to select a different physical description for the controller. This dialog may automatically open during the creation of a controller; see “Creating a Controller” on page 87.

Note that this dialog shows the PDF name for the subsystem to which the controller belongs, initially set during IODF load/resync according to the first control unit type. Changing the physical description affects all controllers within a subsystem (e.g. dual frame); you may only change to a physical description for a subsystem with the same or fewer number of components. If you want to change the PDF for only one controller in a subsystem, you must first ungroup the controllers (see “Grouping Controllers into Subsystems” on page 91).

### Arranging Controller Components

During an IODF load or resync, HCM automatically places new control units inside controllers, creates channel and device interfaces, and connects them to the proper CHPIDs and strings. After the load or resync, you may need to correct the order of these components, or their assignment to controller segments.

Click on the **Arrange...** button in the **Edit Controller** dialog to open the **Arrange Controller** dialog.

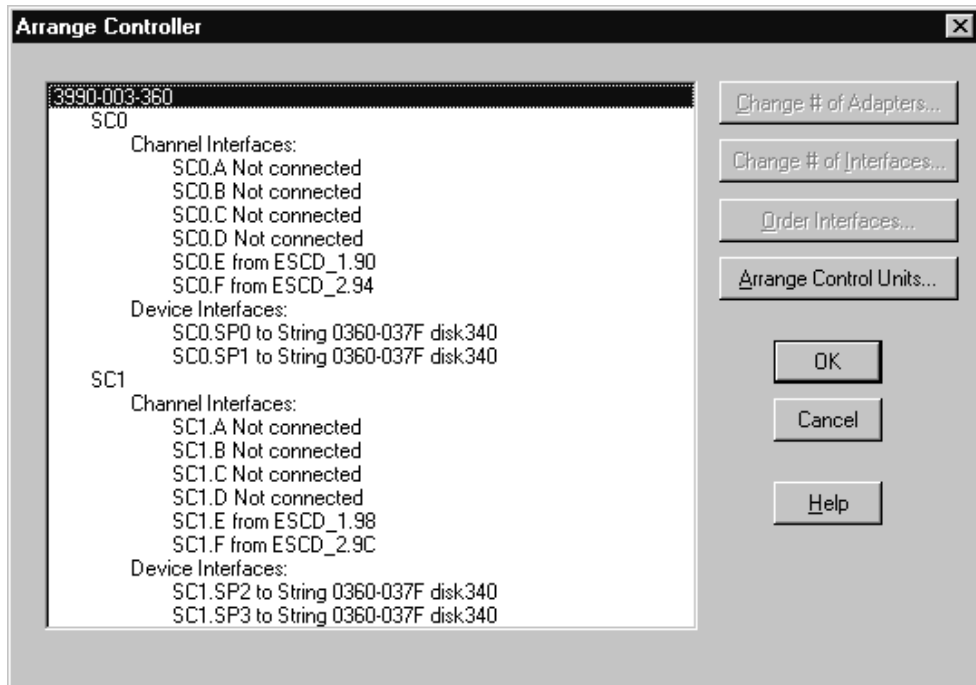


Figure 54. Arrange Controller Dialog

The list box shows all the physical components in the selected controller arranged hierarchically with sub-components listed below and indented from their containing components. See Figure 54 for an example.

Note that many types of controllers are partitioned into two separate sections; HCM uses the term segment to describe this architecture. For example, DASD controllers typically contain two segments.

### Changing the Number of Interfaces

Select a segment (e.g. SC0) from the Arrange Controller list box and press the **Change # of Interfaces...** button. The **Number of Interfaces** dialog appears. You can select a number from the drop down box or type in the field. If you are adding interfaces, the new ones are added to the end of the segment and assigned labels from the physical description; interfaces over the maximum supported by the physical description will be assigned the label "INT". Note that new channel interfaces are created as serial interfaces if the first control unit in the segment is DASD or Tape, otherwise they are created as parallel interfaces.

### Changing the Order of Controller Interfaces

Select a segment from the Arrange Controller list box and press the **Order Interfaces...** button. The **Order Controller Interfaces** dialog appears, allowing you to move channel and devices interfaces from list boxes on the left (old order) to the list boxes on the right (new order). Use the >> and << buttons to move selected interfaces, or double-click on an interface to move it to the opposite list box. Note that you cannot leave this dialog without completely specifying the order for both channel and device interfaces; that is, either the left or right list boxes must be completely full.

### Arranging Control Units and Connections in a Controller

Select a controller that contains more than one segment from the Edit Controller list box and press the **Arrange Control Units...** button. The **Arrange Control Units**

and **Connections** dialog appears to allow you to move the control units, the processor connections, and the string connections between the segments.

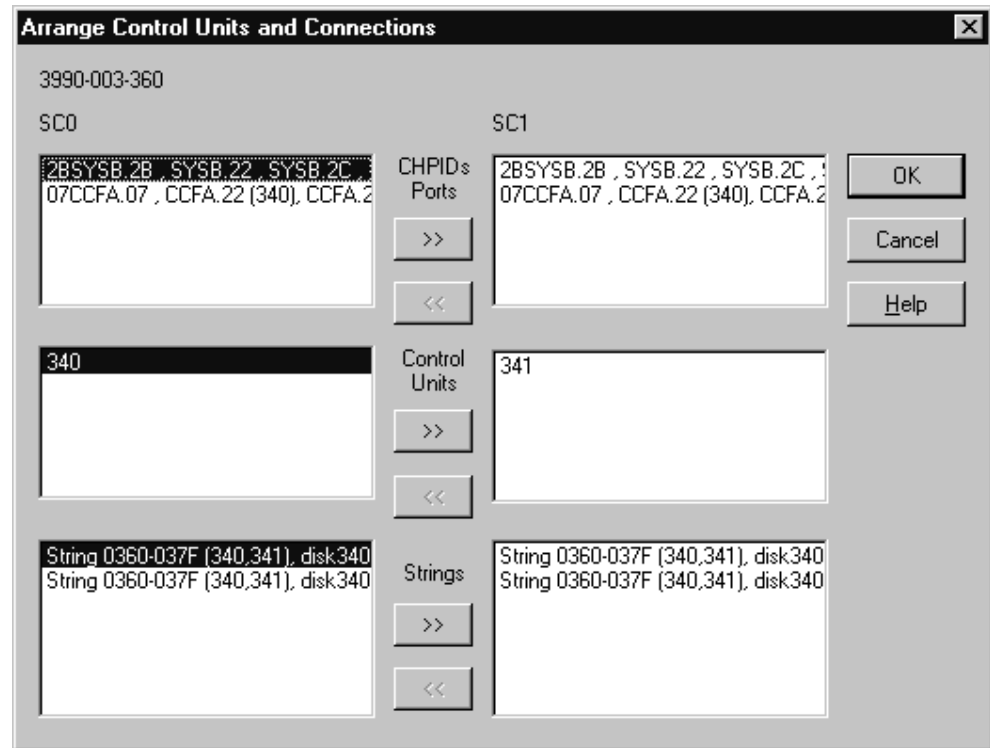


Figure 55. Arrange Control Units and Connections Dialog

You can move components between the segments by using the >> and << buttons to move selected items; alternatively, double-click on a component to move it to the opposite list box. After you have arranged the components, it may be necessary to use the **Order Controller Interfaces** dialog (see “Changing the Order of Controller Interfaces” on page 90) to further correct the order of interfaces within each segment.

### Grouping Controllers into Subsystems

Some controller types can be grouped together in a subsystem. For example, 3990 dual frame controllers or 3803s linked via communications cables

Click on the **Group...** button in the **Edit Controller** dialog to open the **Group Controllers** dialog (see Figure 56 on page 92). The Independent Controllers listbox lists all controllers of the appropriate type that are currently not grouped. You can move a selected controller into or out of a subsystem; HCM will make the appropriate physical changes. Use the >> and << buttons to move selected items; alternatively, double-click on a controller to move it to the opposite list box.

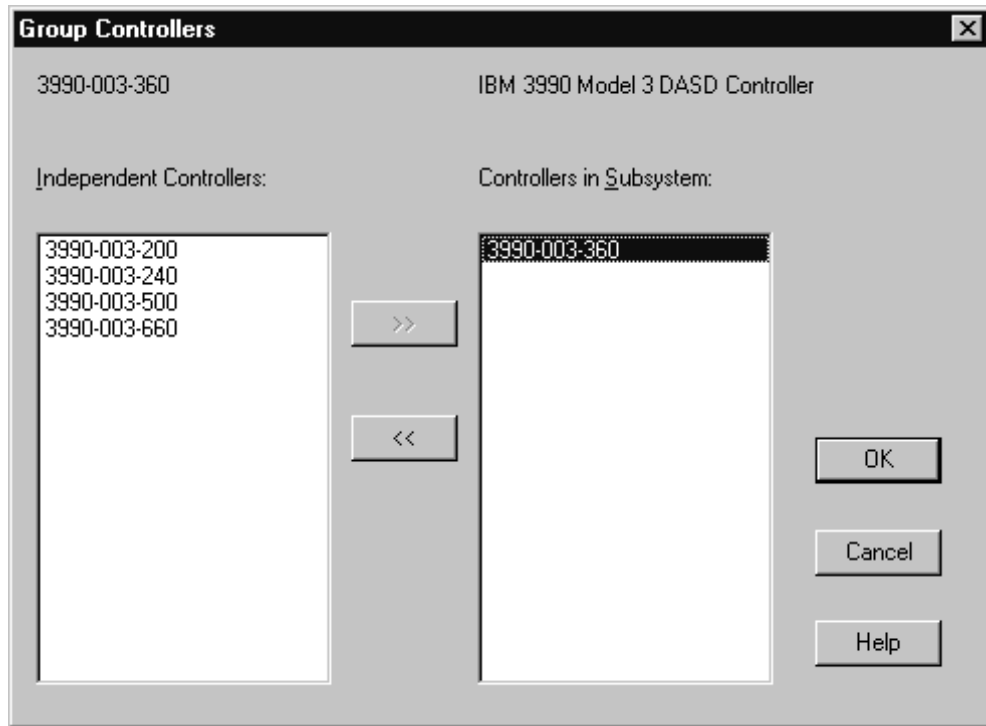


Figure 56. Group Controllers Dialog

## Editing the Fiber Links above the Controller

In the **Controller** dialog, select a channel interface and press the **Fiber Link...** button to open the **Edit Fiber Link** dialog. See “Editing Fiber Links in the Dialog” on page 163 for information on connecting patchports.

## Changing the Channel Interface Type

Select a channel interface from the Interfaces list box in the **Controller** dialog and press the **Type...** button (see Figure 52 on page 87). The **Interface Attributes** dialog will appear, allowing you to make the selected channel interface either serial, parallel (bus and tag), IOC or OSA. See “CHPIDs” on page 81 for more details.

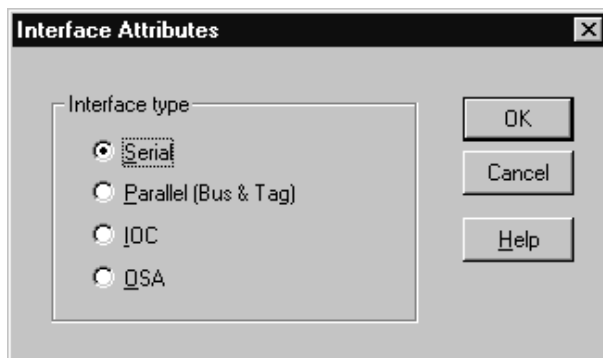


Figure 57. Interface Attribute Dialog

## Deleting a Controller

Select the controller object in the configuration diagram and press the DEL key. HCM will display a confirmation dialog before deleting the controller.

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## Control Units

You can create or modify control units for a selected controller. There are two possibilities to open the **Control Unit List** dialog (Figure 58 on page 94):

- Select a controller by double-clicking on it in the configuration diagram, or by choosing the **Controller...** command from the **Edit** menu and selecting the desired controller from the list which appears. The **Controller** dialog will open for the selected controller; press the **Control Units...** button to display the **Control Unit List** dialog.
- Choose **Control Unit...** from the **Edit** menu and select the control unit name from the list that appears. Note that you can rearrange and filter the list according to your needs. Clicking **OK** causes the **Controller** dialog to open. In this dialog click the **Control Units...** button to display the **Control Unit List** dialog. This dialog lists the control unit you selected from the **Edit** menu.

In the **Control Unit List** dialog you can access related dialogs to create, edit or delete control units. You can view the devices connected to a control unit by selecting the control unit and pressing the **I/O Devices...** button to display the I/O Device List.

Note that you can also access the **Control Unit <=> Processor Definition** dialog by pressing the **CU<=>Proc...** button. This dialog allows you to logically define the selected control unit to all or some of the processors that the controller can reach through physical connections. See “Making a Standard Connection” on page 137 for details.

You can modify the switch control unit by accessing the **Controller** dialog. For more details, see “Editing Switch Port Attributes” on page 110.

The **Status** button allows you to retrieve information by control unit and to check system status.

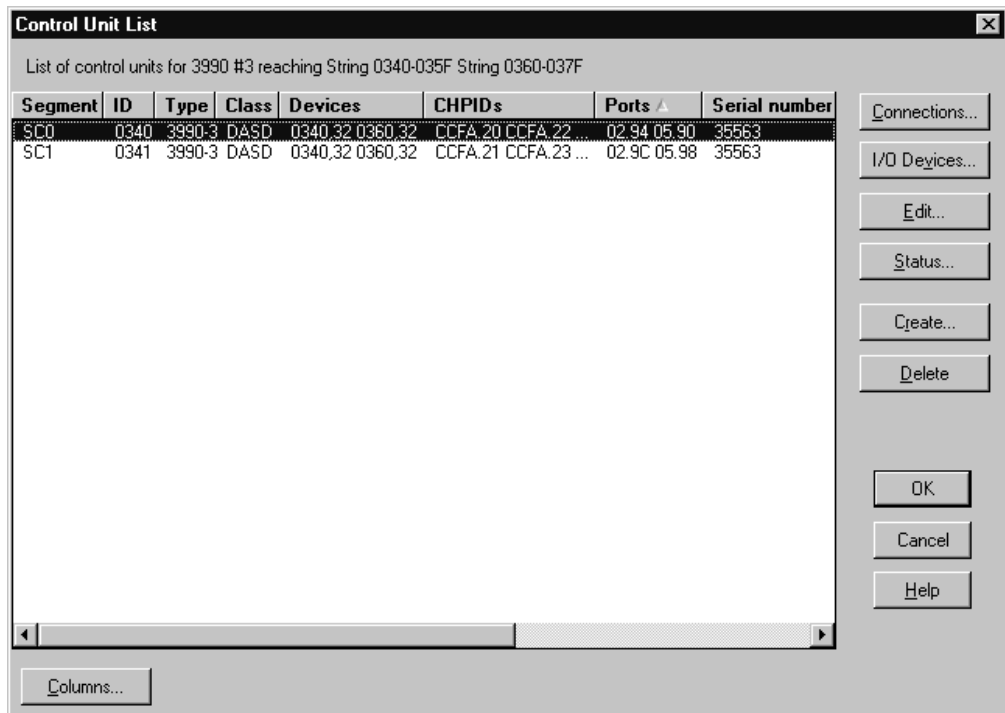


Figure 58. Control Unit List Dialog

## Creating a Control Unit

You can create additional control units for a selected controller. Click on the **Create...** button in the **Control Unit List** dialog to display the **Create Control Unit** dialog. Enter the control unit information and press **OK**. Note that control units have the same serial number as the controller containing them; thus, the serial number shown in this dialog can be only edited in the **Edit Controller** dialog. The control unit is added to the controller in the diagram, and appears in the **Control Unit List** dialog for the controller.

You can also create one or more switch's control units inside a switch. When you create a new switch's control unit inside a switch, it is always connected to port FE of the switch. If you define an existing control unit for a switch, note that this control unit is added into the appropriate switch's *internal structures*. Internal structures of the switch are the switch's control units and devices. You must specify either both a control unit and a device or neither.

### Choosing a Controller Segment to Assign the Control Unit

If the controller has only one segment, any new control units created in the **Create Control Unit** dialog are placed in that segment. If the controller has more than one segment, pressing **OK** in the **Create Control Unit** dialog displays the **Choose Controller Segment** dialog. Choose the segment to which the new control unit will be assigned and press **OK**.

Note that you can assign the control unit to a different segment using the **Arrange Control Units and Connections** dialog (see "Arranging Controller Components" on page 89).

## Editing a Control Unit

Select a control unit from the list box and click the **Edit...** button in the **Control Unit List** dialog. Alternatively, choose **Control Unit...** from the **Edit** menu and select the control unit name from the list that appears. Note that you can rearrange and filter the list according to your needs. The **Edit Control Unit** dialog appears for the selected control unit. You can edit the control unit number, type, and description.

Edit the information and press **OK**. Note that you cannot edit the control unit serial number in this dialog; since it is the same as its controller, you can only edit it in the **Edit Controller** dialog.

## Deleting a Control Unit

Select a control unit from the list box in the **Control Unit List** dialog and press the **Delete** button. HCM will display a confirmation dialog before deleting the control unit from the selected controller.

### Deleting a Switch's Control Unit

You can delete a switch's control unit from a switch. If the control unit has switch's devices defined, a warning message appears stating that HCM will cause implicit deletion of the devices. The reason for implicitly deleting the devices is that leaving a switch's device in an internal string creates a corrupt configuration. Devices are not allowed to reside in the internal string of a switch unless they are logically defined in the IODF to a switch's control unit which is defined to port FE of the switch.

## Moving an Existing Switch's Control Unit Into a Switch

If your configuration contains control units which are meant to be internal to a switch but are not yet connected to the internal control unit port of the switch, you can move a control unit with its associated devices into a switch. To do this, click on the **Add Existing ...** button in the **Control Unit List** dialog.

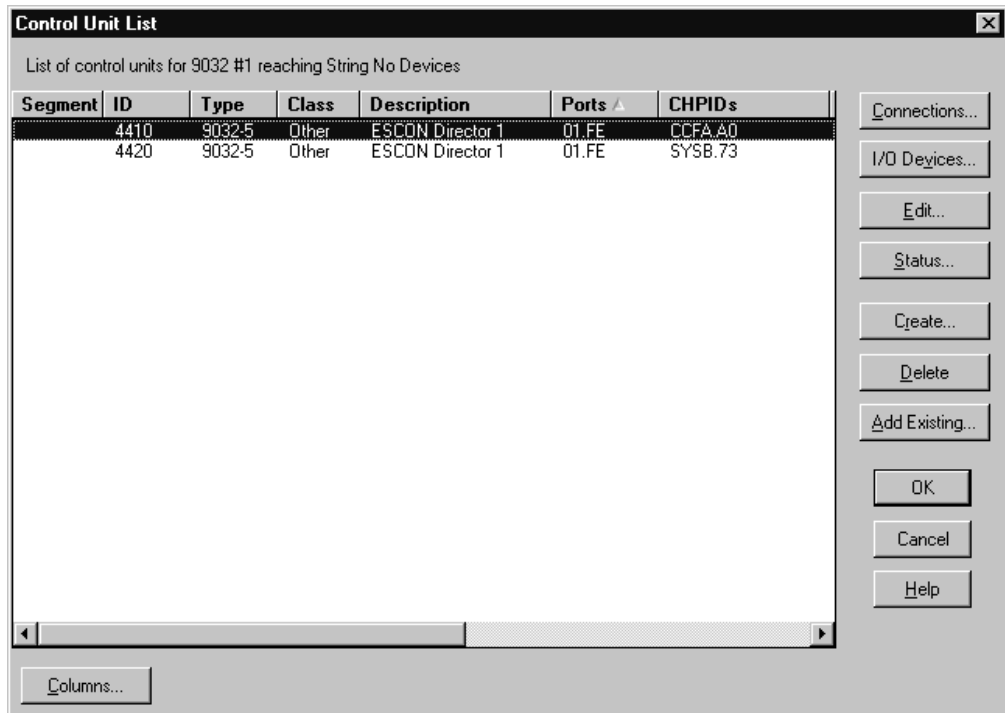


Figure 59. Control Unit List Dialog

The **Add Existing...** button is only displayed on the **Control Unit List** dialog when you reached this dialog via an internal controller. The **Add Existing Control Unit to Internal Controller** dialog is displayed.

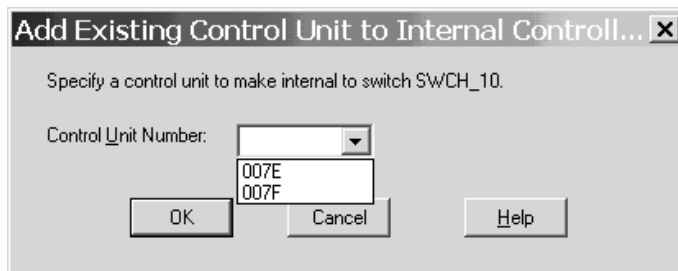


Figure 60. Add Existing Control Unit to Internal Controller Dialog

The drop-down box will display the numbers of all control units in the configuration with the same type as the switch which do not have any connections to switch ports. Thus, the drop-down box does not show control units which are already internal to switches. After your selection of the appropriate control unit, click on **OK** to connect the control unit to port FE of the current switch. You cannot move a control unit which is already connected to another switch port. If the selected control unit has devices under it, they will also be moved into the switch's internal string.

## Strings

A *string* is a collection of one or more I/O devices. The term usually refers to a physical string of *units*, where a unit is a collection of I/O devices in a physical box; however, it may also refer to I/O devices integrated into a control unit. You can create, edit or delete strings, units, and devices by calling up the appropriate dialogs for the string object in the configuration diagram. You can also connect strings to controllers.

You can open the **String** dialog in different ways:

- Double-click on the top rectangle of a string in the configuration diagram.
- Choose **String...** from the **Edit** menu, and select the desired string from the list which appears. Note that you can rearrange and filter the list according to your needs.
- Double-click on a controller in the configuration diagram (or choose **Controller...** from the **Edit** menu) to display the **Controller** dialog; then select a string and press the **Edit...** button in the Strings/Devices section to open the **String** dialog.

The **String** dialog lists all string interfaces and their connections to controllers. You can access related dialogs to edit the string or its I/O devices, or connect a string interface to a controller device interface.

Selecting a string interface and pressing the **Connect...** button begins the process of connecting the I/O devices in the string to the controller, *and* any processors reachable through the controller. The **Select Controller Device Interface** dialog which appears leads to other dialogs allowing you to create any necessary logical definitions for the physical connection. See “Connecting Devices to Controllers” on page 129.

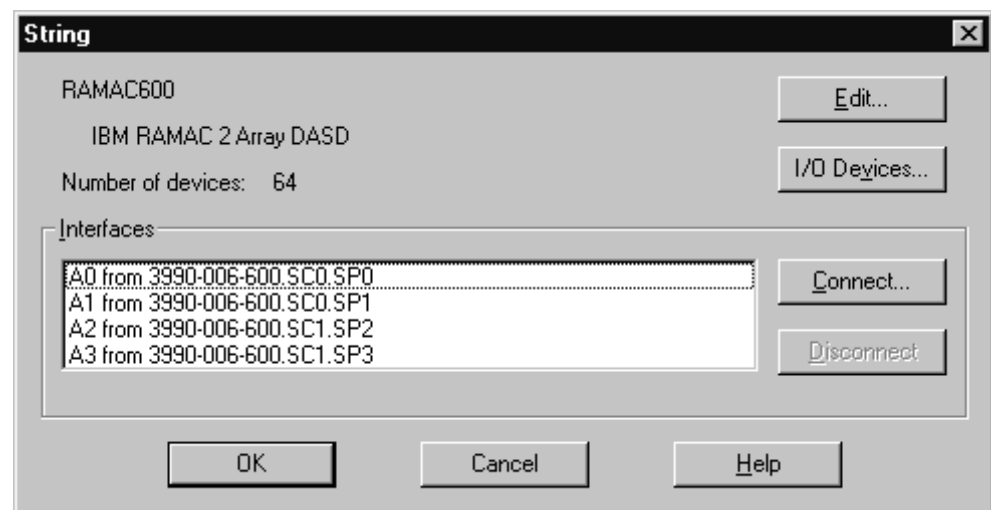


Figure 61. String Dialog

## Creating a String

To create a string, choose **String...** from the **Create** menu to open the **Create String** dialog. Enter the string information and press **OK**. The string object will appear in the configuration diagram. You can then use the **String** dialog and related dialogs to edit the string, its units and its I/O devices, and to connect the string to a controller.

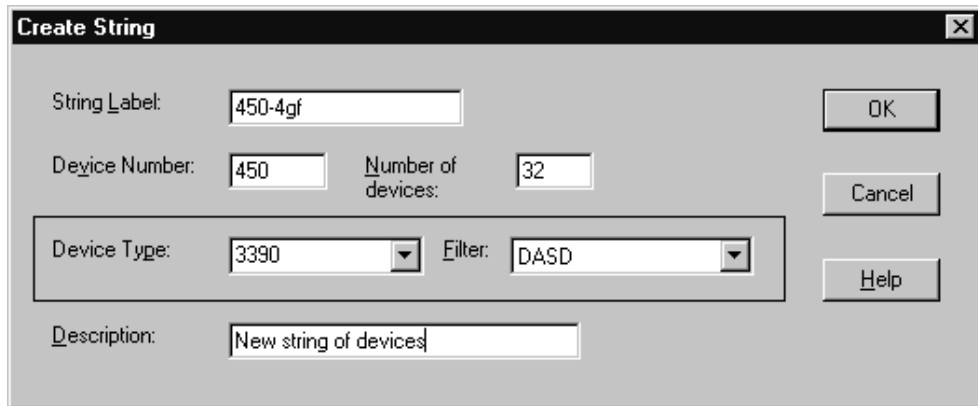


Figure 62. Create String Dialog

To create a string under a controller, first double-click on the controller in the configuration diagram (or choose **Controller...** from the **Edit** menu) to display the Controller dialog. Select a string and press the **Create...** button in the Strings/Devices section to open the **Create String** dialog. After you enter the string information in this dialog, pressing **OK** opens the **String** dialog to allow you to connect the new string to the selected controller (or another controller). You may choose not to connect the string, in which case the string is created, but it is not connected.

Note that serial numbers are assigned in the **Edit Unit** or **Edit I/O Devices** dialog; VOLSERs can be assigned in the latter dialog as well.

### Choose Physical Description

The physical description file, or *PDF*, is a template associated with the controller or string that describes its physical characteristics. See “Graphical Representation of Physical Objects” on page 57 for more details.

If there is more than one physical description possible for the string, pressing **OK** in the **Create String** dialog opens the **Choose Physical Description** dialog. Select a physical description and press **OK** to create the string. If the string was created under a controller, pressing **OK** will open the **Select Controller Device Interface** dialog to allow you to connect the string to the controller.

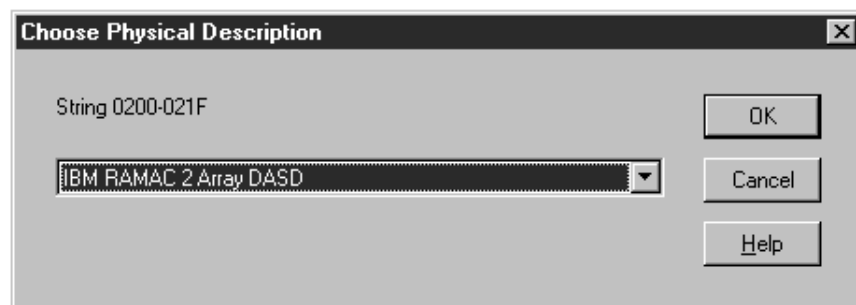


Figure 63. Physical Descriptions Dialog for the Unit Type 3390

## Editing a String

Once you have created a string, you can edit it. Click the **Edit...** button in the **String** dialog to display the **Edit String** dialog. You can edit string information, add user data, or change the physical description for the string. You can assign

devices to units within the string, or change the order or number of string interfaces. Note that you can also create, edit or delete units in the string; see “Units” on page 101 for more details.

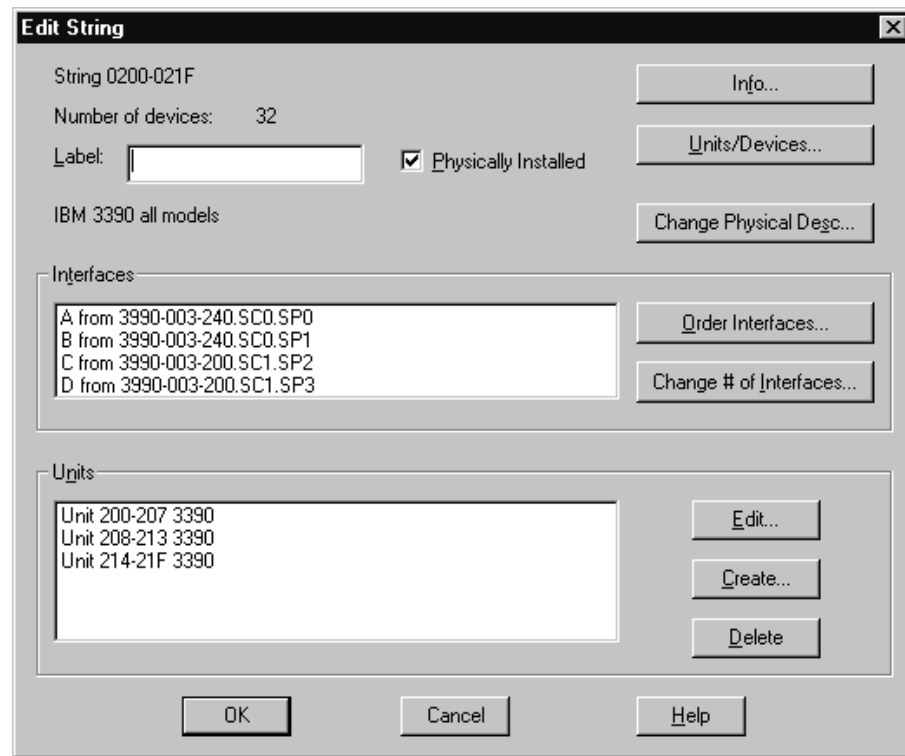


Figure 64. Edit String Dialog

### Adding User Data to a String

Add or edit user data by pressing the **Info...** button in the **Edit String** dialog to display the standard user data dialog. For more details, see “User Data Fields” on page 31.

### Assigning Devices to Units in the String

Click on the **Units/Devices...** button in the **Edit String** dialog to open the **Units/Devices** dialog. Select one or more I/O devices from the listbox and press **Assign...** to open the **Assign to Unit** dialog.

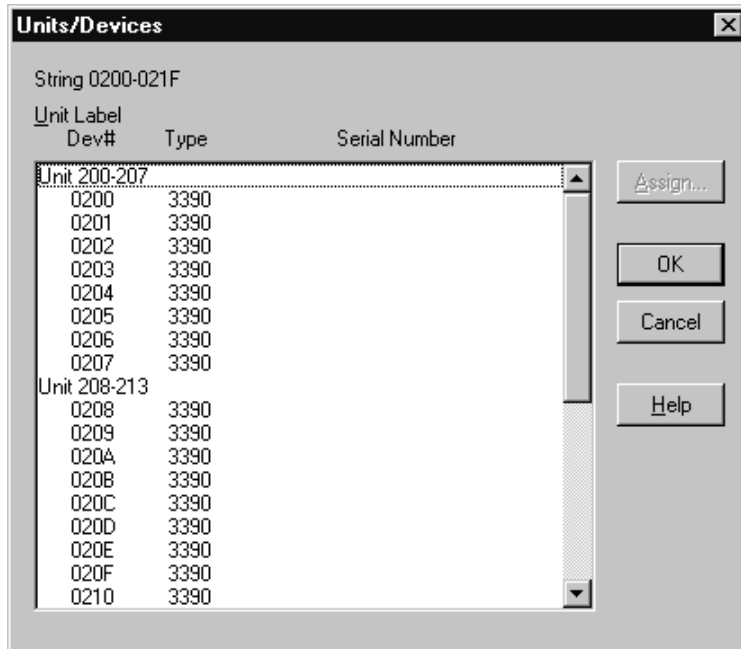


Figure 65. Units/Devices Dialog

Choose the unit to which the devices will be assigned. Use the checkboxes in the View box either to show only the units of this string or to show all units in all strings.

### Changing the Physical Description

The physical description file, or *PDF*, is a template associated with the controller or string that describes its physical characteristics. See “Graphical Representation of Physical Objects” on page 57 for more details.

You can change the physical description for a string. Click on the **Change Physical Desc...** button in the **Edit String** dialog to open the **Choose Physical Description** dialog. When you select a different physical description, the existing I/O devices under the string may be reassigned to units. New units are created as needed; there may be empty units left at the end of the string.

### Ordering String Interfaces

The string interfaces for a selected string are shown in the Interfaces section of the **Edit String** dialog. Click on the **Order Interfaces...** button to open the **Order String Interfaces** dialog. You can then re-order the string interfaces by moving them from the Current Order list box to the New Order list box. See “Ordering Objects” on page 46 for an example of an ordering dialog.

### Changing the Number of String Interfaces

Click on the **Change # of Interfaces...** button in the Interfaces section of the **Edit String** dialog. The **Number of String Interfaces** dialog appears to allow you to change the number of string interfaces.

## Deleting a String

Select the string object in the configuration diagram and press the DEL key. HCM will display a confirmation dialog before deleting the string. Alternatively, you can select a string and its devices from the list and press **Delete** in the **Controller** dialog.

---

## Units

A *unit* is a collection of I/O devices in a physical box; a *string* is a collection of units containing I/O devices. You can create, edit or delete units within a selected string. First, open the **String** dialog by double-clicking on a string in the configuration diagram, choosing the **String...** command from the **Edit** menu, or selecting a string and pressing the **Edit...** button in the Strings/Devices section of the **Controller** dialog. Then click on the **Edit...** button in the **String** dialog to open the **Edit String** dialog. This dialog lists all units in the selected string. Create, edit or delete units by selecting one or more units and pressing the appropriate buttons in the Units section of the dialog.

### Creating a Unit

Click on the **Create...** button in the Units section of the **Edit String** dialog. The **Create Unit** dialog appears; enter the information and press **OK** to create a new unit under the string. Note that you can add units before they are actually physically available; indicated whether the unit is physically installed by clicking in the check box.

You can assign I/O devices to the unit by clicking on the **Units/Devices...** button to open the **Units/Devices** dialog. See “Assigning Devices to Units in the String” on page 99.

### Editing a Unit

Select a unit and click on the **Edit...** button in the Units section of the **Edit String** dialog. The **Edit Unit** dialog appears, allowing you to edit the unit’s serial number and label, and add user data. You can also indicate whether the unit is actually physically installed, and if the unit serial number should be applied to all devices within the unit. Note that if some of the devices have a different serial number, HCM will warn you that this information will be lost by applying the unit serial number to all its devices.

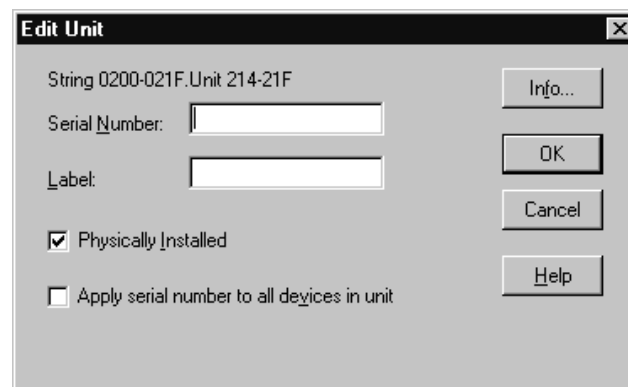


Figure 66. Edit Unit Dialog

### Adding User Data to a Unit

Add or edit user data by pressing the **Info...** button in the **Edit Unit** dialog to display the standard user data dialog. For more details, see “User Data Fields” on page 31.

## Deleting a Unit

Select the unit in the configuration diagram and press the DEL key. HCM will display a confirmation dialog before deleting the unit. Alternatively, you can select a unit from the list and press **Delete** in the **String** dialog.

---

## I/O Devices

I/O devices are grouped into units (physical boxes), which in turn are grouped into a string. You can create, edit or delete the I/O devices for a selected string. When the string is connected to a controller, the I/O devices can be logically defined through the physical connection not only to the controller, but also to any processors that are physically reachable through the connected controller. See “Connecting Devices to Controllers” on page 129 for details.

There are different possibilities to open the **I/O Device List**:

- Open the **String** dialog by double-clicking on a string in the configuration diagram, choosing **String...** from the **Edit** menu, or selecting a string and pressing the **Edit...** button in the Strings/Devices section of the **Controller** dialog. Then click on the **I/O Devices...** button in the **String** dialog.
- Press the **I/O Devices...** button in the **Control Unit List** dialog; note that the **I/O Device List** dialog will not display the **Create...** or **Delete...** buttons when called this way.
- Choose **Device...** from the **Edit** menu and select a device name or a range of devices from the list that appears. Note that you can rearrange and filter the list according to your needs. Clicking **OK** causes the **String** dialog to appear. In this dialog, click on the **I/O Devices...** button.

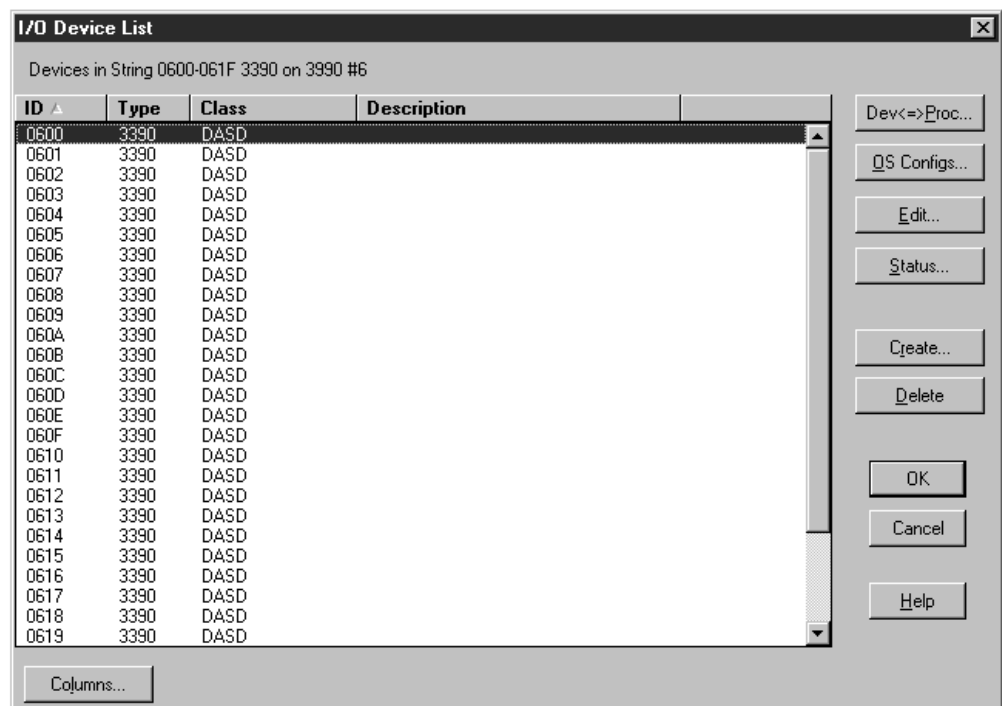


Figure 67. I/O Device List Dialog

The **I/O Device List** dialog allows you to display the serial numbers and VOLSERs, device descriptions, or control unit numbers in the list box by clicking the appropriate option button in the View section.

You can open related dialogs to create, edit or delete I/O devices by selecting one or more devices from the list box and pressing the appropriate button (as described below).

Note that you can access the **I/O Device <=> Processor Definition** dialog by pressing the **Dev<=>Proc...** button. This dialog allows you to select one or more processors to which to define your selected device. See “Making a Custom Connection” on page 132.

**Note:** You can edit the device connected to the *switch control unit* by accessing the **Controller** dialog.

For more details, see “Editing Switch Attributes” on page 109.

## Creating an I/O Device in a String

Click on the **Create...** button in the **I/O Device List** dialog to open the **Create I/O Device(s)** dialog. Fill in the device information and press **OK**. Devices will be allocated to units appropriately. You can change the assignment of devices to units later. See “Assigning Devices to Units in the String” on page 99 for more information.

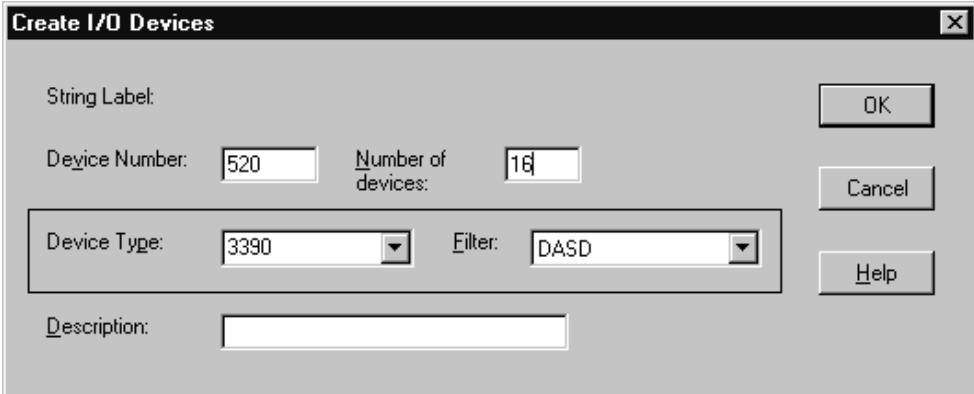


Figure 68. Create I/O Devices Dialog

When you click on **OK**, HCM creates the new devices and connects and defines them to all control units in the appropriate controller segment. This may create logical definitions between devices and connected processors, which you can later edit (see “Connecting Devices to Controllers” on page 129).

You can also create devices inside an internal string of a switch. Note that you can only define one switch’s device at a time to any of the available switch’s control units. When a device is created inside an internal string connect it immediately to a switch’s control unit, otherwise the device would not be classified as internal and would be removed from the internal string on any future resynchronization with the IOBF.

## Editing an I/O Device

Select one or more I/O devices in the **I/O Device List** dialog and click on the **Edit...** button. The **Edit I/O Device(s)** dialog appears; if you selected more than one device, any changes you make in this dialog will apply to all selected devices and the Serial Number and VOLSER fields will be disabled. Device serial numbers can be set for all devices in a unit by editing the unit.

Any changes to VOLSERS that you make with HCM cause an immediate update of the IODF. You can also edit the VOLSERS in stand-alone mode. See also “VOLSER Reconciliation” on page 74.

Edit the information and click on **OK**.

**Note:** You cannot edit a device to change the device number. If it is necessary to change a device number, you must delete the device and create a new one with the desired number.

## Defining Devices to OS Configurations

To define devices to OS configurations, select the device(s) and press the **OS Configs...** button. This opens the **List Device <=> OS Configuration Definitions** dialog. See “Listing OS Configurations to which Devices are Defined” on page 178.

## Deleting an I/O Device

You can only delete an I/O device from the **I/O Device List** dialog, not from the configuration diagram. Select the device(s) in the list box and press the **Delete...** button in the dialog. HCM will display a confirmation dialog before deleting the device(s).

---

## Converters

There are two types of *converters*: those that are used to connect serial ESCON cables to parallel bus-and-tag cables (9034 or S->P), and those that connect parallel to serial cables (9035, or P->S). HCM automatically creates and connects *generic converters* during an IODF load or resync and when you connect a serial to a parallel interface (or vice versa).

*Generic converters* can be replaced with “real” converters that can be assigned a label, serial number, user data, and graphical position on the diagram. HCM maintains an inventory of “real” converters that can replace generic converters in your configuration.

Choose **Converter...** from the **Edit** menu to display the **Converters** dialog, that list converters and their attributes. Note that you can rearrange and filter the list according to your needs. Real converters that are in use can be edited but not deleted. Unused converters can be deleted.

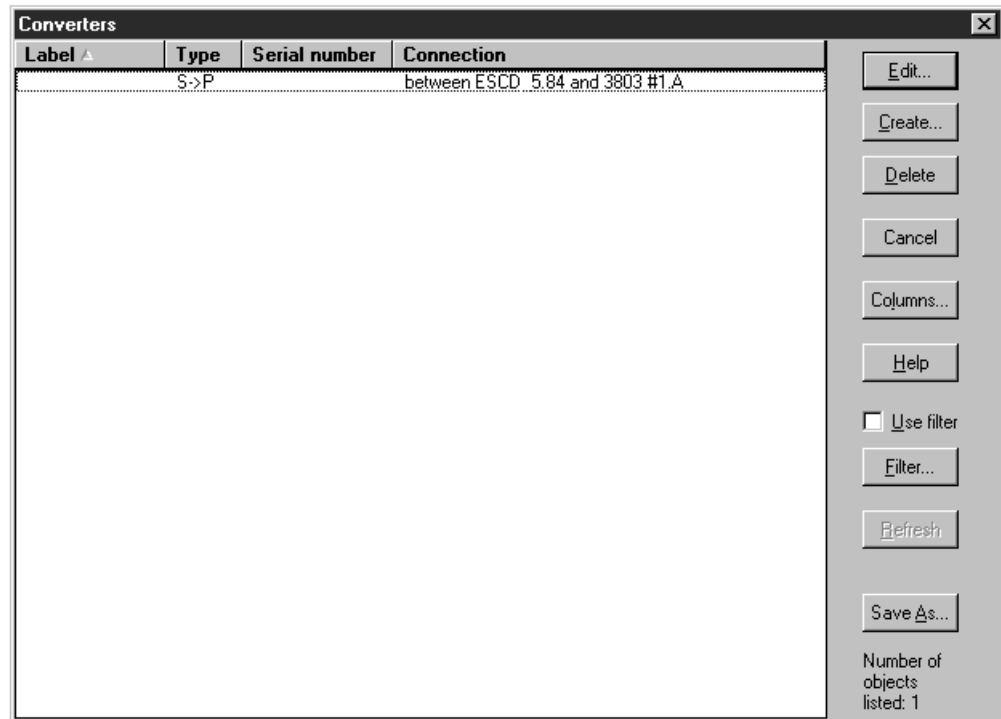


Figure 69. Converters Dialog

## Creating a Converter

In the **Converters** dialog, press **Create** to open the **Create Converter** dialog.

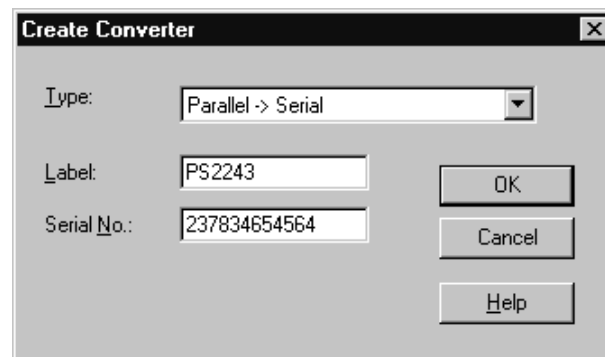


Figure 70. Create Converter Dialog

Select the converter type (P->S or S->P) and enter the label and serial number of the converter. At least one of label or serial number must be specified. Press **OK** to create the converter and return to the **Converters** dialog. The new converter can now be used to replace a generic (or real) converter in your configuration.

## Deleting a Converter

In the **Converters** dialog, select the View option Unused Converters then select the converter(s) that you want to delete in the listbox and press **Delete**. You cannot delete converters that are in use.

## Editing a Converter

Open the **Edit Converter** dialog by double-clicking on a converter in the configuration diagram, or by pressing the **Edit...** button in the **Converters** dialog.

You can edit the fiber link above this converter, if it is an S->P converter, by pressing the **Fiber Link...** button. See “Editing Fiber Links” on page 160.

You can replace this converter with an unused converter or a newly created one by pressing the **Replace...** button. See “Replacing a Converter” below.

You can edit the label, serial no., user data, and graphical position of this converter by pressing the **Edit...** button. This opens the **Edit Converter** dialog.

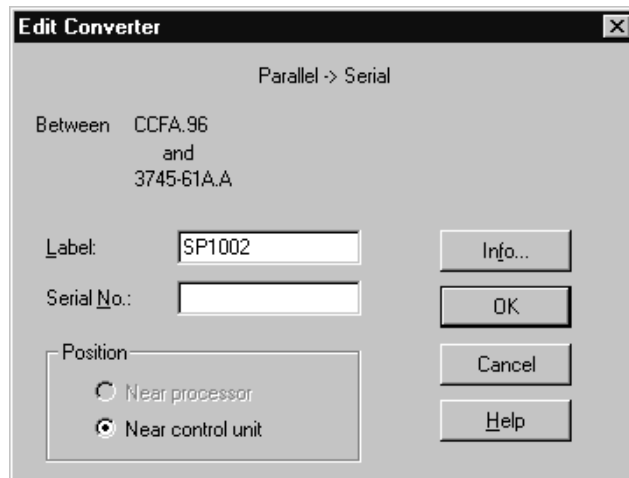


Figure 71. Edit Converter Dialog

**Note:** If this is a generic converter, then you can only edit its position.

## Replacing a Converter

To replace a converter with an unused converter or a newly created one, press the **Replace...** button in the **Converter** dialog. This opens the **Replace Converter** dialog.

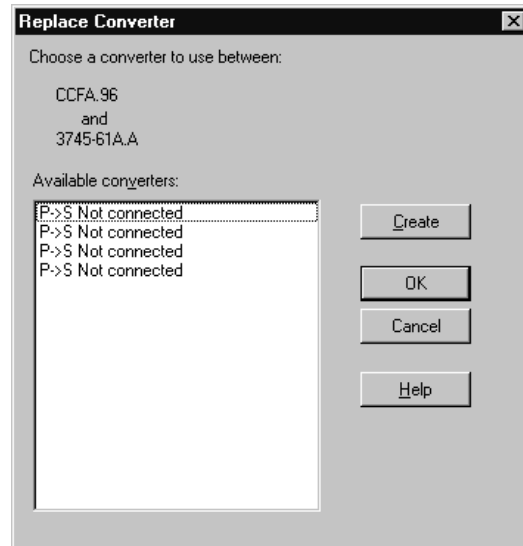


Figure 72. Replace Converter Dialog

The Available converters listbox lists all the unused converters of the appropriate type. To replace the converter with one of these, select the replacement and click **OK**. To create a new replacement converter, press **Create**. This opens the **Create Converter** dialog (see “Creating a Converter” on page 105).

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## Switches

For switches you can dynamically restrict internal connections by specifying a switch configuration. The *switch configuration* is a set of connection rules used to determine which switch ports are connected at any one time. That is, each switch configuration deems that only certain intersections between switch ports are active. Any switch port may connect to any other switch port. HCM allows you to create, view, edit or delete switch configurations. You can also visualize switch configurations by defining a certain switch configuration for each switch. See “Visualizing ESCON or FICON Switch and Crossbar Switch Configurations” on page 37 for information on how to visualize switch configuration.

A switch can be connected through its switch ports to objects above it (processors), beside it (other switches), or below it (controllers or crossbar switches). All switch connections are either ESCON or FICON. See Chapter 7, “Connecting Objects in Your Configuration” on page 127 for more information.

The switch contains *switch control units* which can receive and interpret processor messages to set the switch configuration dynamically. They are always connected to the switch port with the address FE. Each switch control unit is connected to a device, also within the switch. The switch control units and devices do not appear as objects in the configuration diagram. But the reports that are produced via the **Print Reports...** menu, report more than one switch’s control unit and device per switch as appropriate. And access is provided for editing and viewing purposes via the **Edit...** button on the **Switch** dialog.

It is possible to specify a switch without, with one and with multiple switch’s control units and devices. The switch’s control units and devices are also called internal controller, internal string or internal structures.

You can create, edit or delete switches and their ports, control units, devices and fiber links. You can also manage switch configurations for a selected switch.

**Note:** HCM supports a generic FC switch (type FCS) supporting port addresses 00 to FF. This switch type does not support a switch control unit and switch device and therefore cannot be accessed by I/O Operations functions like migrate or activate switch configuration.

## Creating a Switch

Choose **Switch...** from the **Create** menu to open the **Create Switch** dialog. Fill in the information and press **OK** to create a new switch. Note that switch ports will be automatically created and assigned initial addresses based on the type and model of the switch specified.

**Note:** The default for installed switch ports is the minimum range, as specified in the appropriate UIM. To install additional ports, see “Editing Switch Attributes” on page 109.

When you create a switch, the following criteria for the switch’s control units and devices must be met:

- If either a control unit number or a device number is specified, both must be specified.
- If existing control unit numbers and device numbers are specified, the control units and devices must already be connected to one another.

After you have created a switch, you can edit its attributes, ports, control units and devices. You can also connect its switch ports to processor CHPIDs or other switch ports. To connect the switch to controllers below, you must go through the controller dialogs.

## Editing a Switch

Open the **Switch** dialog by choosing **Switch...** from the **Edit** menu and selecting a switch from the resulting list. Note that you can rearrange and filter the list according to your needs. Alternatively, double-click on the desired switch in the configuration diagram. You can view a selected switch’s installed ports and connections in this dialog. You can access related dialogs to edit switch or port attributes, or connect the ports to target interfaces such as CHPIDs or other switch ports. You can also open dialogs to edit the switch configurations for the switch, which determine its internal connectivity at any time.

The plus sign beside the control unit number and the device number in Figure 73 on page 109 is displayed if there are more than one switch’s control units or devices defined to a switch. The switch’s control unit number shown is always the one which is numerically the lowest. The switch’s device number shown is always the one which is defined to the switch’s control unit shown. If the displayed switch’s control unit has no switch’s device defined to it, no device number but only the plus sign is shown to indicate that there are switch’s devices defined for the switch, but not for the shown switch’s control unit.

**Note:** By pressing the **Port Status...** button you get the status of a port, whereas pressing the **Status** button provides you with the switch status.

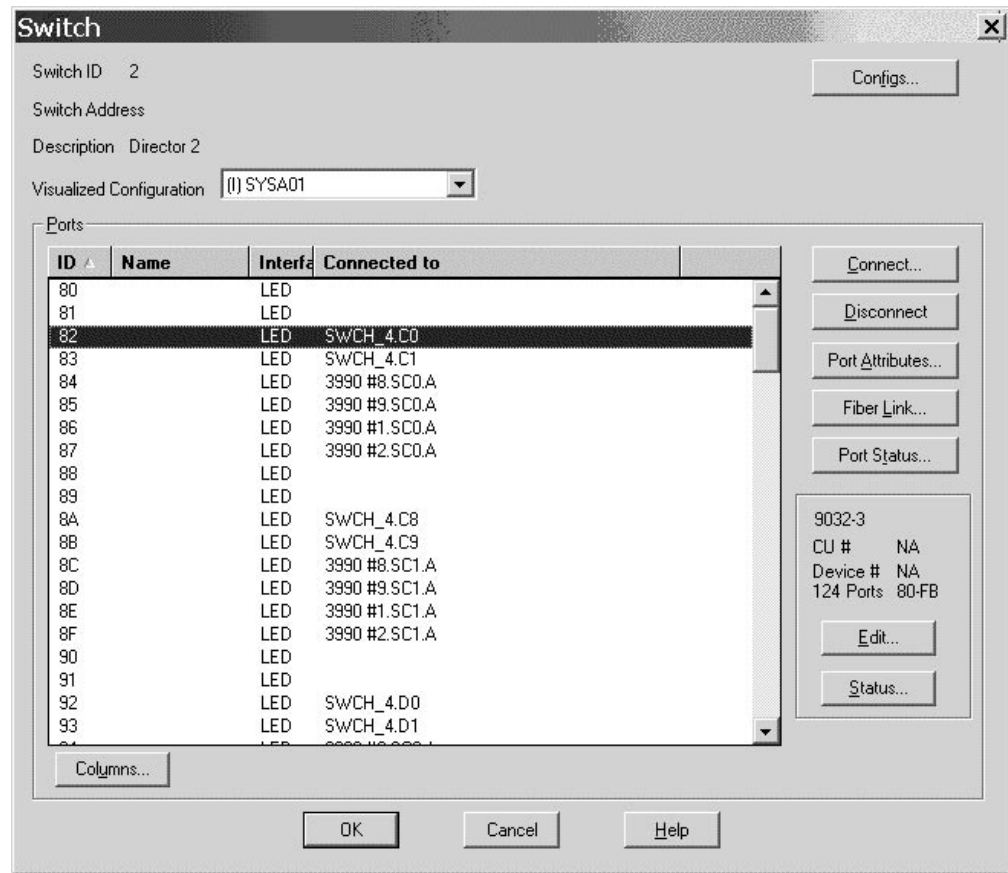


Figure 73. Switch Dialog

## Editing Switch Attributes

Click on the **Edit...** button in the **Switch** dialog to open the **Edit Switch** dialog, which allows you to edit switch attributes as well as to view the switch's port, control unit and device characteristics.

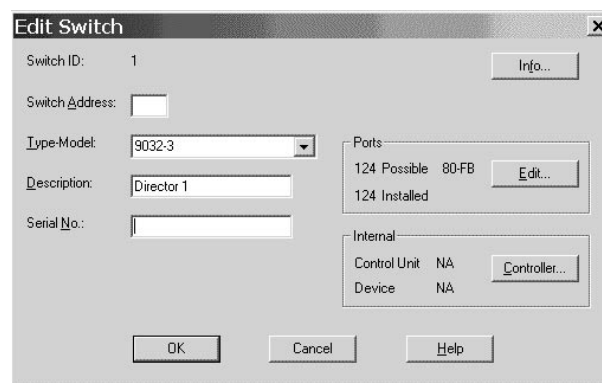


Figure 74. Edit Switch Dialog

From this dialog, you can access related dialogs to add user data, install or remove switch ports, edit the switch's control units or I/O devices, and set up connections to the control units.

Add or edit user data by pressing the **Info...** button to display the standard user data dialog. For more details, see “User Data Fields” on page 31

Click on the **Edit...** button in the Ports section to open the **Switch Ports** dialog. You can then select one or more ports from the list box to install or remove (uninstall). HCM assigns all installed ports the type indicated in the Newly Installed Ports Are... section: either Multimode (LED) or Single-mode (Laser).

The switch’s control units and attached devices are displayed in the Internal section. Clicking on the **Controller...** button opens the **Controller** dialog. From here, you can access related dialogs to create or edit the switch control units and devices. See “Controllers” on page 86 and “I/O Devices” on page 102 for more details.

As in the **Switch** dialog in Figure 73 on page 109 the plus sign in the Internal section indicates that there are more than one switch’s control units or devices defined to the selected switch.

The **Status** button displays the switch status, and the **Port Status** button displays the port status.

### Editing Switch Port Attributes

Select one or more switch ports from the list box and click on the **Port Attributes...** button in the **Switch** dialog. The **Port Attributes** dialog appears, allowing you to edit the attributes of the selected switch port(s). If you select more than one port, this dialog appears for you to edit each in succession.

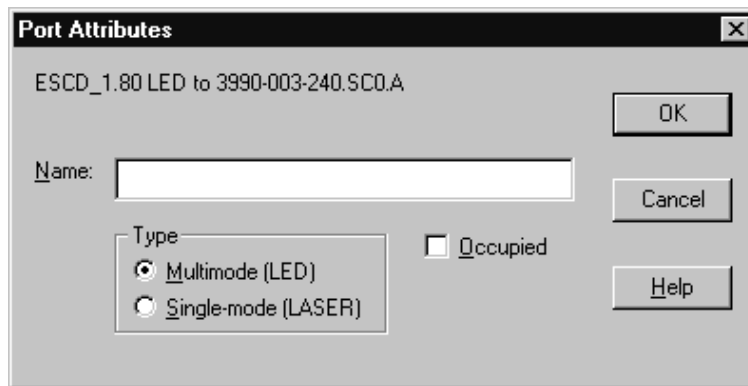


Figure 75. Port Attributes Dialog

### Editing Fiber Links Above the Switch

Select one or more switch ports connected to a target serial interface such as a CHPID and click on the **Fiber Link...** button in the **Switch** dialog. The **Edit Fiber Link** dialog will appear, allowing you to edit the composition of the fiber link. See “Editing Fiber Links” on page 160 for more information.

### Moving Ports

If you need to move CHPID-to-control-unit connections from one switch to another or need to rearrange such connections on a single switch, HCM offers you the **Move Port Connections** wizard under the **Utilities** menu. Refer to Moving Port Connections on page 169 for a description of this wizard.

## Deleting a Switch

Select the switch object in the configuration diagram and press the DEL key. HCM will display a confirmation dialog before deleting the switch. The switch's control units and devices are deleted as well.

See also "Deleting a Switch's Control Unit" on page 95.

## Managing Switch Configurations

Open the **Configurations for Switch XX** dialog by clicking on the **Configs...** button in the **Switch** dialog. You can then select a switch configuration associated with the specified switch to edit or delete, you can create a new configuration, or you can edit a port matrix.

For ESCON switches, the configurations can be stored either in the IODF or on the switch itself. You can work with the configurations stored on the switch, provided the ESCON Manager or I/O Operations is installed and running (see Chapter 11, "User Interface to I/O Operations" on page 187).

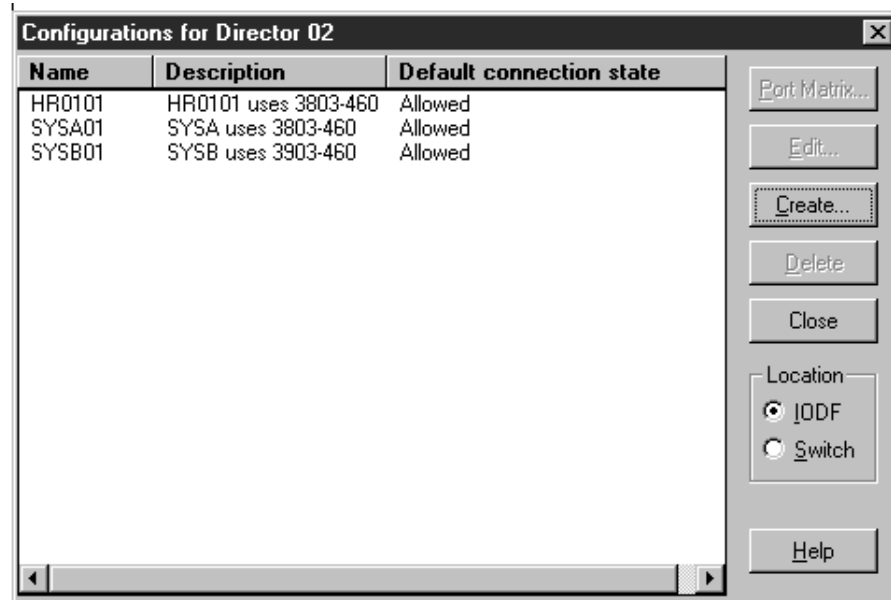


Figure 76. Configuration for Switch XX Dialog

### Creating a Switch Configuration

Click on the **Create...** button in the **Configurations for Switch XX** dialog to open the **Create Switch Configuration** dialog. You can set the default connection state to be *allowed* or *prohibited*.

If the radio button **IODF** is active in the **Location** field, the **Create Switch Configuration** dialog will include a checkbox **Generate default matrix**. This checkbox is disabled if **Switch** is active instead.

When generating switch port matrices, all defined logical paths will be analyzed by HCD and in the case of chained connections, all possible paths of chaining switches will be determined by the visualized configurations.

## Editing a Switch Configuration

Click on the **Edit...** button in the **Configurations for Switch XX** dialog to open the **Edit Configuration for Switch XX** dialog. You can change the default connection state to be *allowed* or *prohibited*.

## Editing a Port Matrix

Open the **Edit Port Matrix XX for Switch YY** dialog by selecting a switch configuration from the list box and clicking on the **Port Matrix...** button in the **Configuration for Switch XX** dialog. You can also double-click on a switch configuration.

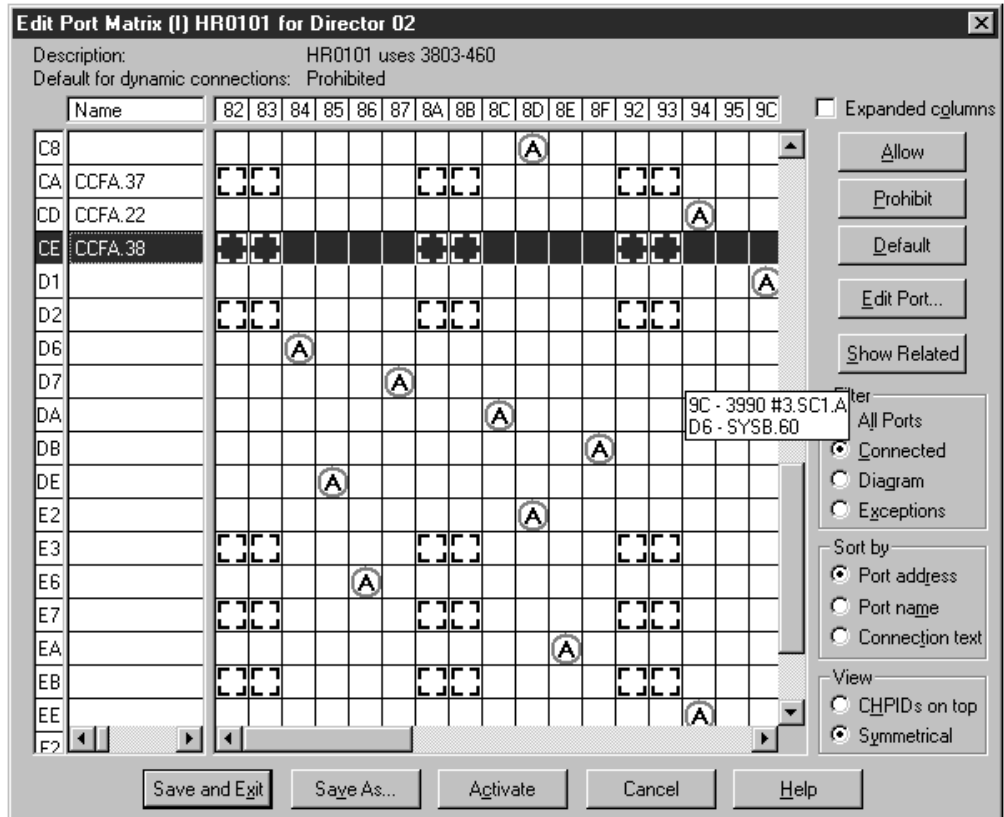


Figure 77. Configuration Port Matrix

The large scrollable window to the right is the *configuration port matrix*. Each row or column in the matrix corresponds to a port; each cell represents the intersection between a row port and a column port.

The scrollable window to the left of the port matrix is the port attributes window, displaying the attributes for each switch port (each row in the matrix). The columns in this window display the port name, whether the port is blocked or dedicated, and the identity of the CHPID or control unit (if any) connected to the port. This window will scroll vertically with the port matrix window.

You can drag the gray separator between the two windows to alter their relative widths.

You can select individual cells or you can select ports by clicking on the row or column header. Select a number of cells or ports by holding the Shift or CTRL key while clicking, or by clicking and dragging. Besides the window functions, you can

also use the keyboard (arrow keys, page-up, page-down...) to move around the port matrix. In order to get more information about a port intersection or port heading, keep the cursor over an intersection or a heading. After a short delay a small pop-up window appears that shows more detailed information (for example, how a port is connected).

Cells may contain different symbols with the following meaning:

*Table 5. Symbols in Port Matrix*

Symbol	Description
Black square	These ports have a dedicated link to each other.
Hollow square, hollow circle	There is a logical connection defined between the control unit and the CHPID connected to the ports of this intersection.  Square: A connection requires a dedicated link.  Circle: The intersection is used for a dynamic connection.  A green color indicates that the port matrix data allows a connection, a black color indicates that the port matrix data does not allow a connection.
Broken square, broken circle	These symbols are used if there are several possible paths for control unit to CHPID connections through chained switches.  Square: A connection requires a dedicated link.  Circle: The intersection is used for a dynamic connection.
Letter A or P, or blank	These symbols indicate explicit "allows" or "prohibits" of dynamic connections.  A: Dynamic connections are allowed.  P: Dynamic connections are prohibited.  Blank: The default connection is used.
Speckled background	Either the row port or the column port is blocked. If a port is blocked, the whole row or column appears with speckled background.

Click on the **Allow** or **Prohibit** buttons to change the connection state of all selected cells in the port matrix to *allowed* or *prohibited*, respectively.

Clicking the **Default** button changes the connection state of all selected cells in the port matrix window to whatever the default is set. To set the default connection state, click on the **Edit** button in the **Configurations for Switch XX** dialog.

**Changing the View of the Matrix:** HCM allows you to filter and rearrange the view of the matrix according to your needs.

Click on the **Expanded columns** check box to enlarge the column header and show abbreviated text indicating to what the port is connected.

The radio buttons of the **Filter** group allow you to reduce the number of ports that will be shown in the matrix. Working in conjunction with the Filter radio buttons is the **Show Related** push button that operates on selected ports. To enable this button select one or more ports by clicking on the row or column heading. When you click the **Show Related** push button, HCM filters the matrix to show only

those ports that have intersections of interest with the selected ports. An intersection of interest is one that contains a logical control unit to CHPID definition or a dedicated connection. Clicking the now available **Restore Filter** button returns the matrix to the view when the **Show Related** button was clicked.

The radio buttons of the **Sort by** group controls the order of the ports in the rows and columns.

Use the radio buttons under **View** to rearrange rows and columns. The **Symmetrical** radio button shows the matrix in the traditional symmetrical format. Thus, each port is shown twice, once in row and once in column. The **CHPIDs on top** radio button shows ports connected to CHPIDs as columns and ports connected to control units as rows.

The following figure shows a configuration matrix that is filtered to show only those ports that are connected and that has the **CHPIDs on top** radio button selected. The columns are expanded and the cursor rested over an intersection to show more information.

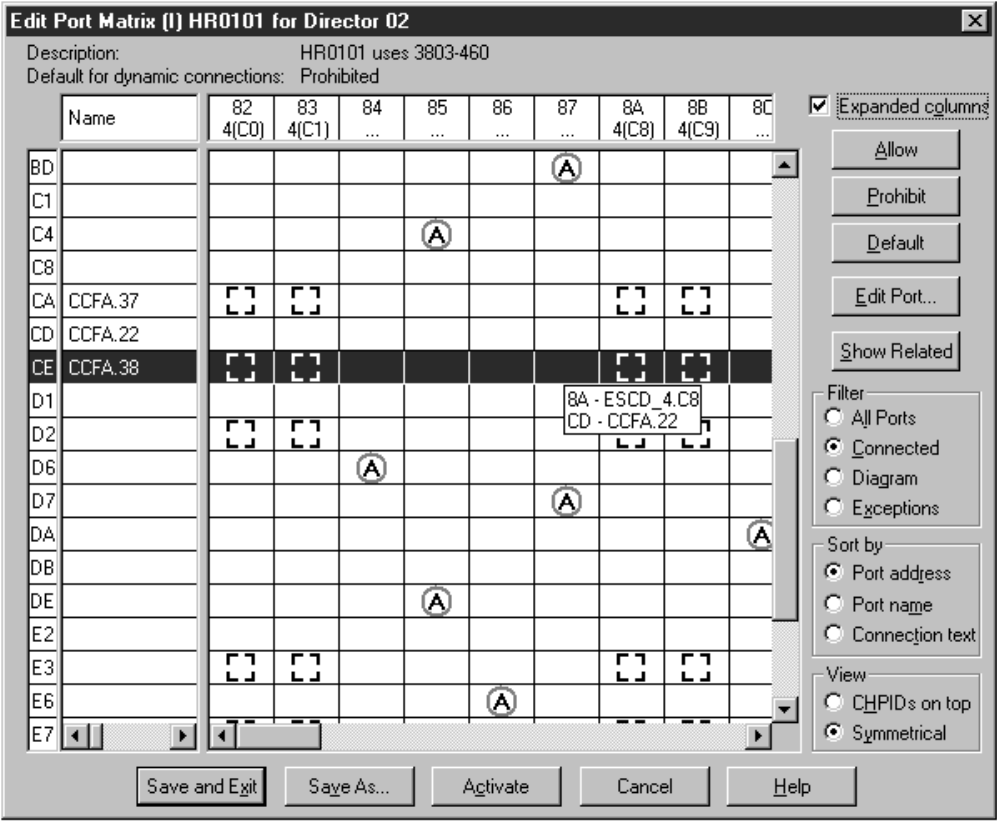


Figure 78. Configuration Port Matrix - Filtered and CHPIDs on Top

### Visualizing a Switch Configuration

HCM can evaluate information from switch configurations. The diagram can show dedicated connections or blocked ports. In addition, when highlighting objects in a diagram, HCM can use the switch configuration data to show what particular route is used for CHPID-to-control-unit definitions (see “Visualizing ESCON or FICON Switch and Crossbar Switch Configurations” on page 37 for more detailed information).

To visualize a switch configuration, you first have to associate one particular switch configuration to each switch. Select **Visualized Matrices...** from the **View** menu. In the following **Define Matrix Set** dialog, you can associate one switch configuration to each switch. Alternatively, you can select a configuration for a specific switch in the **Switch** dialog. You can save these definitions and display them later on again using **Save Named Matrix Set** and **Restore Named Matrix Set** under the **View** menu.

### Editing Switch Ports in a Configuration

Open the **Edit Switch Port** dialog by selecting a port(s) and clicking on the **Edit Port...** button in the **Edit Port Matrix XX for Switch YY** dialog. If more than one port is selected, this dialog will appear for each port in succession. Alternatively, you can double-click on a port in the port attributes window of the **Edit Port Matrix XX for Switch YY** dialog.

You can block the selected switch port, such that it can never be connected while blocked. Blocked ports are indicated as rows of cells with a light gray background, in the port matrix window of the **Edit Port Matrix XX for Switch YY** dialog.

You can also choose a port to which to create a dedicated connection. Note that ports with dedicated connections are not available for other connections. Ports with dedicated connections are indicated as rows of cells with a light gray background, in the port matrix window of the **Edit Port Matrix XX for Switch YY** dialog.

### Activating a Switch Configuration

Using the **Activate** button in the **Edit Port Matrix** dialog, you can activate a switch configuration after editing it.

### Deleting a Switch Configuration

Select the switch configuration in the list box of the **Configurations for Switch XX** dialog and press the **Delete** button. HCM will display a confirmation dialog before deleting the switch.

---

## Crossbar Switches

A *crossbar* is a static switch through which you can route physical connections between controllers and processors. The crossbar switch contains a number of *channel interfaces* on its top, which can connect to objects above it, such as processors, ESCON switches or other crossbars. It also contains a number of *control unit interfaces* on its side, which can be connected to objects below it, such as controllers or other crossbars. (See Chapter 7, “Connecting Objects in Your Configuration” on page 127 for more details).

Crossbar channel interfaces are always parallel (bus and tag). You can create, edit or delete crossbars, order their interfaces or connected objects, and define crossbar configurations.

### Creating a Crossbar Switch

Choose **Crossbar switch...** from the **Create** menu to display the **Create Crossbar Switch** dialog. Fill in the information and press **OK**. New and unconnected crossbars appear at the extreme right in the configuration diagram. After you create the crossbar, you can edit it, or connect its channel interfaces to objects above, such as processor CHPIDs or other crossbar control unit interfaces.

## Editing a Crossbar Switch

Open the **Edit Crossbar Switch** dialog by choosing **Crossbar switch...** from the **Edit** menu and selecting a crossbar switch from the resulting list. Note that you can rearrange and filter the list according to your needs. Alternatively, double-click on a crossbar switch object in the configuration diagram. Use the edit dialog to change the characteristics of the crossbar or add user data. You can connect the crossbar to objects above it, edit objects below it, document crossbar configurations, or re-order crossbar interfaces.

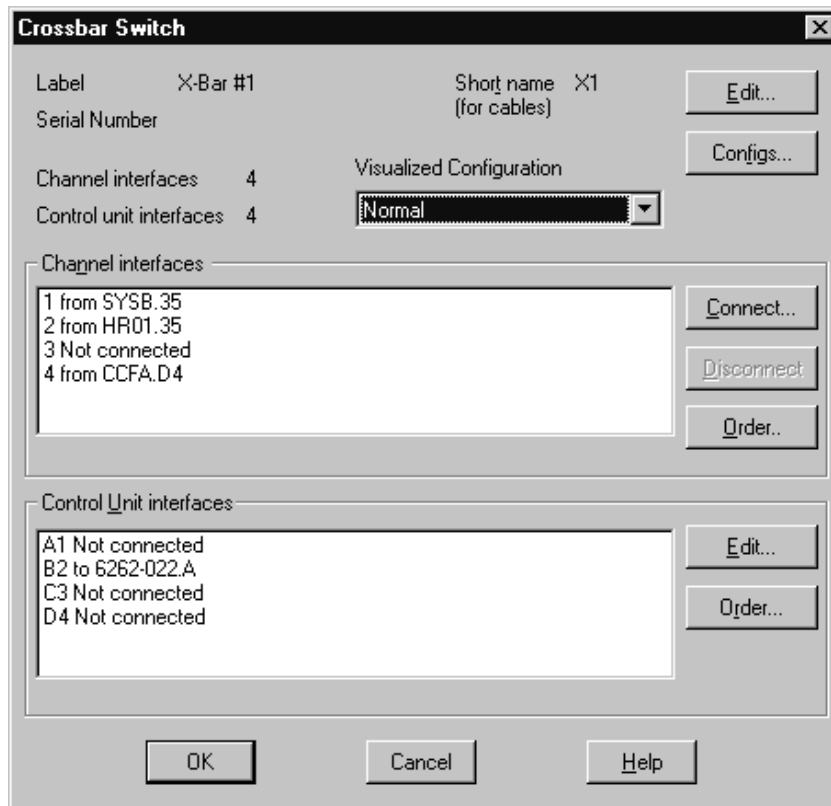


Figure 79. Edit Crossbar Switch

### Adding User Data to a Crossbar Switch

Add or edit user data by pressing the **Info...** button in the **Edit Crossbar Switch** dialog to display the standard user data dialog. For more details, see “User Data Fields” on page 31.

### Recording Crossbar Configurations

You can record different settings of crossbar switch connectivity as *crossbar configurations*. These are not used in the IODF, and do not change the logical configuration of the crossbar. Click on the **Configs...** button in the **Crossbar Switch** dialog to open the **Crossbar Configurations** dialog. You can add, delete or rename crossbar configurations for the selected crossbar switch, as well as set a default configuration.

Use the crossbar configuration diagram to document a configuration. Click on an intersection point between the crossbar’s channel interface and control unit interface; a large dot appears to indicate a connection. Click on a dot to remove the connection. You can move around the diagram by using the scroll bars and arrows.

After you have documented switch connectivity in the crossbar configuration diagram, you can name the configuration to record it. Click on the **Add...** button in the **Crossbar Configurations** dialog to open a standard name dialog. Type in the name of the new crossbar configuration. Note that all crossbar configurations will be produced in hardcopy format when you choose the Switch Reports option in the **Print Reports** dialog. To rename the crossbar configuration, select it and click on the **Rename...** button to open the standard name dialog.

You can select a crossbar configuration and delete it. Pressing the **Delete** button displays a confirmation dialog before deleting the configuration. Note that the last crossbar configuration for a crossbar switch cannot be deleted.

Use the default configuration to designate the crossbar configuration typically used. Select a crossbar configuration and click on the **Set** button. The default will be displayed in the Normal/Default configuration field.

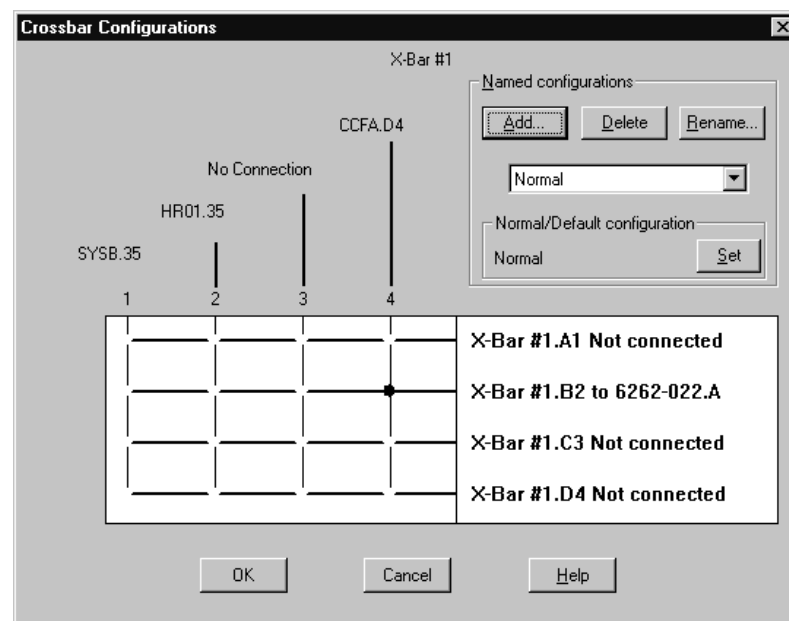


Figure 80. Crossbar Configurations Dialog

## Setting the Size of a Crossbar Switch

Open the **Edit Crossbar Switch** dialog by clicking on the **Edit...** button in the **Crossbar Switch** dialog. You can change the number of channel or control unit interfaces for the selected crossbar switch by selecting one or more values from the appropriate drop down list boxes.

## Editing Controllers Connected to Crossbar Control Unit Interfaces

In the **Crossbar Switch** dialog, select a control unit interface and press the **Edit...** button in the Control Unit Interfaces section. This opens the **Edit Crossbar Control Unit Interface** dialog which lists all controllers (and possibly other crossbars) connected to the control unit interface. Select one and press the **Edit Object...** button.

## Ordering Controllers Connected to a Crossbar

From the **Edit Crossbar Control Unit Interface** dialog, press the **Order...** button. This opens an order dialog, allowing you to order the controllers (and possibly other crossbars) that are daisy-chained on this interface.

## Ordering Crossbar Channel or Control Unit Interfaces

Click on the **Order...** button in either the Channel Interfaces or Control Unit Interfaces section of the **Crossbar Switch** dialog. A standard order dialog appears, allowing you to reorder the channel or control unit interfaces for the selected crossbar switch. See “Ordering Objects” on page 46. chapter for an example of an ordering dialog.

## Visualizing a Crossbar Switch Configuration

HCM can evaluate information from crossbar switch configurations. When highlighting objects in a diagram, HCM can now use the configuration data to show what particular route is used for CHPID-to-control-unit definitions (see “Visualizing ESCON or FICON Switch and Crossbar Switch Configurations” on page 37 for more information).

To visualize a crossbar switch configuration, you first have to associate one particular configuration to each crossbar switch. Select **Visualized Matrices...** from the **View** dialog. In the following **Define Matrix Set** dialog, you can associate one configuration to each crossbar switch. Alternatively, you can select a configuration for a specific switch in the **Crossbar Switch** dialog. You can save these definitions and display them later using **Save Matrix Set** and **Restore Matrix Set** under the **View** menu.

## Deleting a Crossbar Switch

Select the crossbar switch object in the configuration diagram and press the DEL key. HCM will display a confirmation dialog before deleting the crossbar switch.

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## Cabinets

Fiber management cabinets are an important part of many configurations. HCM supports the routing of fiber links through any number of patchports. See “Editing Fiber Links” on page 160 for more information.

**Note:** Besides ESCON links, you may also have FICON links in your configuration. The information provided for ESCON links also applies in most cases to FICON links as well.

In HCM, all fiber management cabinets are simply called “cabinets” regardless of how they are used. Cabinets are part of the physical information that you can add in HCM to supplement the logical information from the IODF. Each cabinet can have one or more **panels**, arranged one above the other. A cabinet has a number of places to hold panels, called **panel spaces** in HCM.

Panels are organized into port groups of patchports, arranged side by side. They can be numbered starting from zero or one, from the top or the bottom of the cabinet.

A *port group* is the smallest number of patchports (typically six or three) that can be individually installed or uninstalled. Each port group can be installed individually from the **Install Port Groups** dialog.

A *patchport* comprises a pair of ESCON/FICON adapters or couplers. Any number of patchports can participate in a fiber link. The total number of patchports in a cabinet is the *number of panels* multiplied by the *number of port groups in each panel* multiplied by the *number of patchports in each port group*.

HCM provides a predefined set of patchport naming formats. In addition, you can create your own customized naming formats. In either case this is done by providing a *Patchport Naming Format* to the cabinet definition. Individual patchport labels can be edited explicitly to overwrite the naming format in those cases where the format language is not adequate. See “Syntax of the User-Defined Patchport Naming Format” on page 120 for more information.

In the case where HCM provides a predefined set of patchport naming formats, a unique *patchport label* is created for every patchport. A patchport label is four or five characters long, in one of the following formats:

- **Consecutive numbers.** The first one or two letters are the short name of the cabinet. The following three numbers are the patchport number within the cabinet.
- **Port and group** consists of alternating letters and numbers. The first one or two letters are the short name of the cabinet. This is followed by the panel number (within the cabinet), the port group letter (within the panel), and the patchport number (within the port group). For example, the patchport label F2C4 denotes patchport 4 within port group C of panel 2 in cabinet F. Port groups are lettered from A to Z, skipping the letters I and O. Patchport numbers can start from 0 or 1.

Graphically, cabinets appear as unconnected boxes to the right of other objects to simplify the configuration diagram. However, the cabinet’s patchports that form part of the fiber link between two objects are drawn as small rectangles in the connection. Selecting a cabinet highlights all its patchports in the diagram. Selecting a patchport highlights the entire fiber link through that patchport.

You can include or exclude cabinets and patchports from your view of the configuration diagram with the appropriate **View** menu commands. After you have created cabinets and patchports, you can make any permanent connections among them, before making the logical connections in your configuration and editing the fiber links. For more information, see “Editing Fiber Links” on page 160 and “Infrastructure Connections” on page 160.

## Creating a Cabinet

Choose **Cabinet...** from the **Create** menu to open the **Create Cabinet** dialog. In this dialog you can now choose the **Patchport Naming Format**. The drop-down list contains a number of predefined format strings as well as any additional user-defined format strings that are defined in currently existing cabinets in this HCM configuration file.

For more information about patchport naming formats, see “Syntax of the User-Defined Patchport Naming Format” on page 120.

Enter the cabinet information and press **OK**. The following guidelines are recommended for creating a unique ID of one or two letters for the cabinet:

1. The ID is alphabetic to distinguish it from the panel number that follows.
2. If all cabinets are in the same building, use one letter for the ID.
3. If the cabinets are in different buildings, use two letters for the ID, with the first letter indicating the building.

You can suggest where HCM should draw the cabinet and its patchports in relation to other objects in the configuration diagram. Change the position of individual patchports using the **Position Patchport** dialog.

**Note:** You cannot change the #Groups and #Ports fields later.

## Syntax of the User-Defined Patchport Naming Format

To create user-defined patchport names, you must define a format string to the cabinet definition. A format string consists of any sequence of characters that may be embedded with proxy strings. Proxy strings are delimited by `'%'` characters and are replaced with the appropriate text when a patchport name is displayed.

Following proxies are allowed:

**%CABINET%**  
ID of the cabinet

**%PANEL%**  
panel number

**%GROUP%**  
port group number

**%PORT%**  
patchport number

The numerical proxies (`%PANEL%`, `%GROUP%`, and `%PORT%`) can be qualified by width, conversion, and ordering specifications, so that the general syntax of a numerical proxy is

**%[width][conversion] <proxy>[/<qualifier>]%**

where `[ ]` indicates that the enclosed items are optional, and `{ }` indicates that the enclosed items may appear zero or more times. The individual items are broken down as follows:

**width** A decimal number in the range of 0 to 4. This indicates the width in characters of the actual text that should appear here. If the conversion is decimal or hex (see below), leading zeroes will be used to pad to the appropriate width; if the conversion is alphabetical, leading underscore characters will be used. If the width is zero or omitted, the actual text will use only as many characters as necessary.

### conversion

- d** Convert number to text using decimal format
  - x** Convert number to text using hexadecimal format
  - c** Convert number to text using alphabetical format (i.e. 0 converts to A, 1 converts to B, etc.). The letters 'I' and 'O' are left out of the alphabet. Wrapping past Z will use an extra letter (e.g. AA).
- If no conversion character is specified, decimal conversion is used.

**<proxy>**  
PANEL, GROUP, or PORT

**<qualifier>**  
Always preceded by `'/'`

- 0** Start numbering at zero (not valid for alphabetical conversion)
- 1** Start numbering at one (not valid for alphabetical conversion)

- L** Start numbering at left (numbers increase as we move from left to right)
- R** Start numbering at right (numbers increase as we move from right to left)
- T** Start numbering at top (numbers increase as we move from top to bottom)
- B** Start numbering at bottom (numbers increase as we move from bottom to top)
- H** Numbering proceeds in horizontal direction from origin, proceeding to the next row when the end of the row is reached
- V** Numbering proceeds in vertical direction from origin, proceeding to the next column when the end of the column is reached
- G** Port numbering is with respect to group
- P** Port or group numbering is with respect to panel
- C** Port, group, or panel numbering is with respect to cabinet

**Note:** Those qualifiers that are grouped together above may not be used in combination; for instance `%PORT/0/1%` would not be valid (numbering may start from either 0 or 1, but not both).

**Defaults:**

The default qualifiers are `/0/L/T/H`, indicating that ordering starts at zero from the top left and proceeds horizontally first.

As for the scope qualifier (G, P, or C), the default is `/G` for proxy `%PORT%`, `/P` for proxy `%GROUP%`, and `/C` for proxy `%PANEL%`.

Regular text can be included in the format string.

Comments, delimited by curly braces, can be embedded in the format string. All characters between the leading `'{'` and the trailing `'}'` will be ignored. Comments are not allowed within the proxy delimiters.

The back slash `'\'` character can be used (outside of comments and proxies) to allow the `'%'`, `'{'`, and `'}'` characters to be treated as regular characters.

In addition, `'\\'` is treated as a single back slash.

## Editing a Cabinet

Once the cabinet is created, you can edit cabinet information, add user data, and install or uninstall port groups. You can also add or modify patchports (see “Patchports” on page 122 below). To display the **Cabinet** dialog, choose the **Cabinet...** command from the **Edit** menu. Select the desired cabinet from the list

that appears. Note that you can rearrange and filter the list according to your needs. Alternatively, double-click on the cabinet object in the configuration diagram.

To edit the cabinet information, click on the **Edit...** button in the **Cabinet** dialog to open the **Edit Cabinet Details** dialog. Make your changes by overtyping the fields and press **OK**. The changes appear in the **Cabinet** dialog.

If you increase the number of panel spaces, the new panel spaces are created at the bottom if they are numbered top down, or vice versa. Decreasing the number creates the opposite effect; the highest numbered panels are deleted first. Note that you can only delete a panel if none of its patchports is part of the configuration diagram.

### Adding User Data to a Cabinet

Add or edit user data by pressing the **Info...** button in the **Cabinet** dialog to display the standard user data dialog. For more details, see “User Data Fields” on page 31.

## Deleting a Cabinet

Select the cabinet object in the configuration diagram and press the DEL key. HCM will display a confirmation dialog before deleting the cabinet.

As the user-defined formats will be deleted as well, you can save your formats (through cut & paste) in a separate file, so you can use your own created formats again.

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## Patchports

Each cabinet can have one or more panels, arranged one above the other. Panels are organized into port groups of patchports, arranged side by side. A *port group* is the smallest number of patchports that can be individually installed or uninstalled. A *patchport* comprises a pair of ESCON/FICON adapters or couplers. Any number of patchports can participate in a fiber link. The total number of patchports in a cabinet is the *number of panels* multiplied by the *number of port groups in each panel* multiplied by the *number of patchports in each port group*. HCM creates a unique *patchport label* for every patchport.

To view the patchport dialog panel, double-click on a cabinet in the configuration diagram (or choose **Cabinet...** from the **Edit** menu and double-click the appropriate cabinet). This opens the panel similar to that shown in Figure 81 on page 123.

You can view all patchports and their connections, make or break connections, position patchports in the configuration diagram, locate the currently selected patchport, or edit the fiber link of which the selected patchport is a part. Buttons are disabled when they are not valid for the selected patchport.

To change your view of the patchports in a panel, use the scroll bar. Display or hide the cables and objects connected to the front or back of each patchport by clicking the **Front** or **Back** check box. You can display all cables and objects connected to each patchport, or only the nearest cable and object, using the **Show Entire Link** check box.

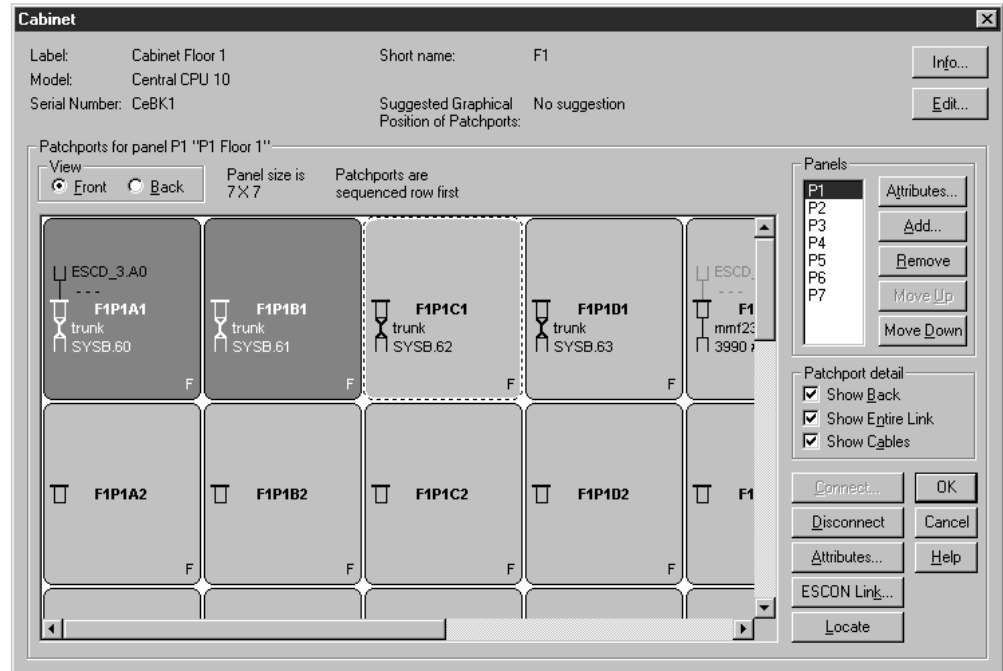


Figure 81. Edit Cabinet Patchports Dialog

The **Cabinet** dialog offers the possibility of viewing the patchport from the front or the back. For this purpose two radio buttons have been provided on the front panel in the **View** box.

It is also possible to select a number of patchports simultaneously. This gives you the possibility of performing operations on the selected patchports as a group. Specifically, the **Connect...**, **Disconnect**, **Attributes...**, and **Locate** buttons can operate on all of the selected patchports at once.

## Cabinet Dialog Controls

The following explains the controls on the **Cabinet** dialog:

### 1. Patchports for panel X group box.

This large group of controls shows the attributes and patchports for the panel selected in the *Panels* list box. As the selection in the *Panels* list box changes, the label of this group box changes to display the panel ID and description. The text fields indicating panel size and the sequencing attribute are also updated. Of course, the patchport viewing area is updated, too, to show the patchports for the selected panel, but the horizontal scrolling position remains constant, as long as the new panel being displayed has enough columns. The patchport viewing area shows patchports for the selected panel and may be scrolled vertically or horizontally to show all the patchports. The patchport label is shown in bold near the centre of the patchport. Connection information for the back of the patchport is shown above the label, while connection information for the front is shown below.

A couple of visual cues indicate what view is being shown:

- An **F** is shown in the bottom right corner of every patchport if the front view is shown. This is changed to a **B** in the top left when the back is shown.
- To indicate the connections that are affected by **Disconnect**, connections extending from the "viewing" side are written in black, and connections extending from the other side are shown in gray.

2. **Panels** group box.

This box shows the labels of all of the panels in the cabinet. The **Add** and **Attributes...** buttons lead to dialogs that have an editable combo box for the panel's patchport naming format. Changing the naming format in this dialog and clicking OK will update the patchport viewing area to reflect the new patchport names. This box is also used to add or remove panels and move up or down the **Panels** to change the order.

3. **Patchport detail** box.

The check boxes here control the level of detail shown in the patchport viewing area. Connection information for the patchport's immediate neighbor is always displayed for the side being shown.

- The **Show Back/Show Front** check box changes depending on the particular view. If it is checked, then the viewing area shows (in gray) connection information for the side not currently being viewed.
- The **Show Entire Link** check box determines how much of the connection is displayed. If this is not checked, then only the neighbour immediately connected to the back or front of the patchport is shown. Checking this option will cause the patchport to expand so it shows not only the immediate neighbour(s), but also all the other interfaces in the complete fiber link. This option affects only the side being viewed if the **Show Back/Show Front** option is turned off.
- The **Show Cables** check box expands the patchport further, to accommodate the labels of cables involved in the fiber link. The names of the cables (or - - - for anonymous cables, or **Trunk** for anonymous trunks) are shown between the interfaces they serve.

4. **Connect** button.

This is disabled if the "viewing" side of one or more of the selected patchports is already connected. Clicking it invokes the **Select Connection Target(s)** dialog. The interface(s) that are selected from the subdialog will be connected directly to the patchports selected in this dialog. Interfaces that are already involved in complete fiber links will be valid connection targets for patchports. Connecting to such interfaces will insert the patchport and its trailing patchports into the fiber link (you will be asked to confirm this type of connection). This allows infrastructure connections to be established after a load.

5. **Disconnect** button.

This is disabled if none of the selected patchports are connected on the "viewing" side. Clicking this button will attempt to disconnect all the selected patchports that are connected on the viewing side. Disconnect works as follows:

- If one or more of the patchports is connected "permanently" on the viewing side, then HCM will ask the user to confirm the disconnect action. In this case, these connections will be marked as mutable before proceeding.
- For each of the patchports:
  - If the patchport is involved in a "logically complete" connection, then HCM will remove this patchport from the chain together with any others that are permanently connected to it without breaking the logical link. If all of the connections extending from the other side of the patchport are permanent, then the disconnect action will be refused. If the disconnect action succeeds, HCM will issue a message to indicate that the patchport chain(s) were removed without breaking the logical connection.
  - If the patchport is not involved in a "logically complete" connection, then the patchport will simply be disconnected from its partner.

**Note:** HCM has deliberately been designed so that "logically complete" connections cannot be created or broken via the **Cabinet** dialog. The primary purpose of **Connect...** and **Disconnect** on the **Cabinet** dialog is to make (or in rare cases, break) infrastructure connections. Otherwise, use the **Switch** or **Controller** dialog to establish or break connections.

6. **Attributes...** button

Clicking this button will invoke the **Patchport Attributes** dialog panel.

7. **Fiber Link...** button

This is disabled if none of the selected patchports is involved in a complete fiber link. Clicking this button will invoke the **Edit Fiber Link** dialog (a number of times in succession if necessary). See "Editing Fiber Links" on page 160 for information on connecting patchports.

8. **Locate** button

This is disabled if none of the selected patchports is involved in a complete fiber link. Clicking it will close the dialog and highlight all the selected patchports that are permitted to appear in the dialog. This option is only available for patchports that are part of the configuration diagram.



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## Chapter 7. Connecting Objects in Your Configuration

This section explains how to connect objects to one another, after you have built your configuration and modified objects in the configuration diagram. Connecting involves making both physical connections between physical objects (strings, controllers, switches, machines) and logical definitions between logical objects (devices, control units, switch ports, CHPIDs, and so on).

A *connection* is a known physical path ‘realized’ by one or more cables. Note that purely physical objects such as cables, patchports, crossbar switches, or converters may appear in the connection between a controller and a processor, but are not taken into account by the connection. These objects are not represented in the IODF; you must add and connect them in HCM.

The *physical connection* between two objects enables appropriate *logical definitions* between these and other “reachable” objects to be made. Objects must be physically connected before they can be logically defined. When an IODF is loaded into HCM, the IODF logical definitions are represented as connections between objects in the diagram, and as attribute information in the appropriate dialogs. Use HCM to add, delete or modify physical connections and associated logical definitions.

In HCM, you connect objects that are lower on the diagram to those that are higher. For example, you connect strings to controllers (not vice versa) and you connect controllers to processors (not vice versa).

The recommended order in which you connect objects is from the top of the diagram down. For example, connect controllers (to processors) before connecting strings (to controllers), and connect switches (to processors) before connecting controllers to switches.

Objects are actually connected through their *interfaces*. A string interface for a string of I/O devices can connect to the device interface of a controller. The controller in turn can connect through its channel interface to a processor CHPID, possibly through switch ports, crossbar control unit and channel interfaces, cabinet patchports or converter interfaces.

There are two types of connections: serial and parallel. *Serial* connections (also called *fiber link*) are always point-to-point from one serial interface to another. Serial connections use optical fiber technology.

*Parallel* connections use “bus and tag” cables. Parallel interfaces can be *daisy chained*. A controller with a parallel interface typically has two plugs: one is connected to a processor CHPID, the other to another controller or terminator cap. Note that any devices attached to daisy chained controllers can “reach” the processor connected to the first controller in the chain. That is, all devices are physically connected and logically defined to the processor, even though only one controller is directly connected.

Controllers and crossbar switches can be daisy chained. The rule of thumb is “any interface on the top side of an object which is a parallel interface can be daisy chained to similar object interfaces”. You can order daisy chained objects.

Processor CHPIDs and controller channel interfaces can be serial or parallel. ESCON and FICON switches have serial interfaces; crossbar switches have parallel. Converters (P->S or S->P) may, therefore, be required in the connection between a controller and processor.

---

## Connecting Objects

To make a typical connection, double-click on the object that you wish to connect upwards to another. An appropriate edit dialog will appear; select the object's interface and press the **Connect...** button. Another dialog appears from which you can select a target object interface to connect.

In the case of connecting devices to controllers, or controllers to processors, switches, or crossbars, you can choose to make a physical, standard or custom connection.

*Physical connection:*

Makes a physical connection with no logical definitions.

*Standard connection:*

Makes the physical connection and all appropriate logical definitions, using standard values. The standard values are determined by HCD and depend on the UIMs for the control units or devices involved, the type of CHPIDs involved, and existing connections.

*Custom connection*

Makes the physical connection, and allows you to customize the attributes of selected logical definitions. Note that you can customize connections between a controller and a processor, ESCON or FICON switch, or crossbar using the **Standard ...** button in the **Select Connection Target(s)** dialog. For details, see "Connecting Controllers to Processors" on page 135.

You will typically choose to make standard connections.

HCM will check that the connections you make are valid. HCM automatically creates ESCON converters when they are required. Note that you do not have to disconnect a connection before reconnecting to another interface.

The new connection will initially have no physical cable assigned. You can assign a cable from the unused cables pool or from inventory. Cables assigned to connections which have been disconnected or reconnected become *unused cables* which "remember" where they were last used. Cables in inventory are generally available for use by any object. See Chapter 8, "Physical Connections" on page 155 for more details.

**Tip:**

Note that making or breaking a connection may move the selected object such that it is no longer visible in the current view. You may have to zoom out and then in, or scroll around to find the selected object.

## Positioning Objects Along Daisy-Chained Connections

A number of controllers can be daisy-chained on a CHPID. Daisy-chains can also exist under crossbar switches, S->P converters, and controllers.

If you are connecting an object to a target that is already connected to one or more objects, the standard **Position Interface** dialog will appear to allow you to *position* the object you are connecting with respect to the others.

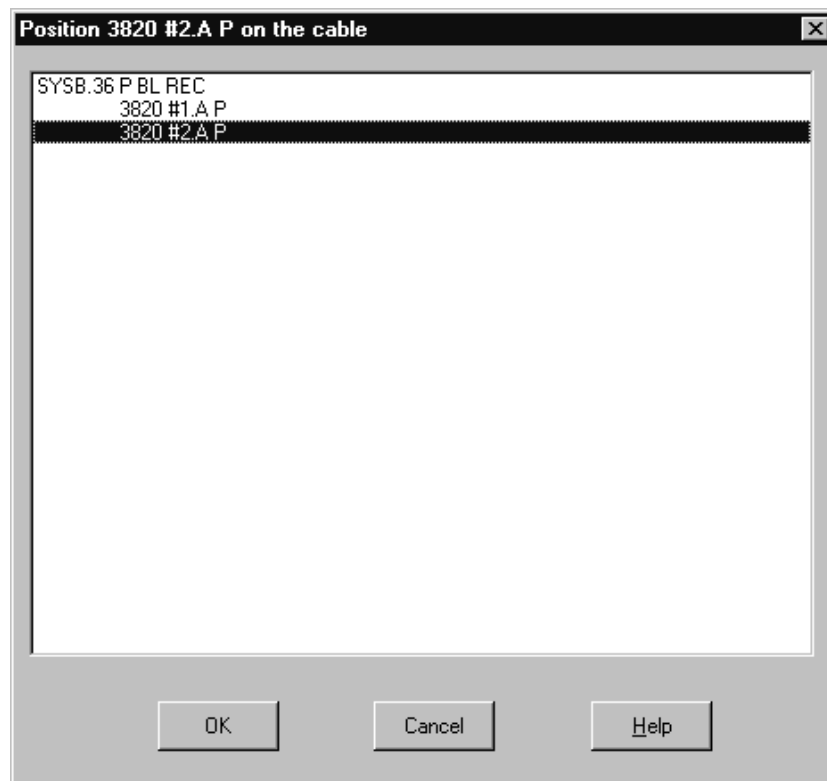


Figure 82. Positioning an Object for Daisy-Chained Connections

Select an object in the list box and drag it through the list to the object that will immediately follow it. Release the mouse button; the object will be repositioned in the daisy- chain. Alternatively, select the object and use the arrow keys on the keyboard to move it up or down the list. By default, HCM attaches the new object to the end of the chain.

---

## Connecting Devices to Controllers

I/O devices connect to processors through controllers. If the controller is daisy chained to other controllers, all devices attached to controllers in the chain can “reach” any connected processors.

More specifically, the *string interface* on a string of devices connects to the *device interface* on a controller; the controller channel interface in turn eventually connects to one or more processor CHPIDs. The connection between device and controller is always between parallel (bus and tag) interfaces, whereas the connection between controller and processor may be parallel and/or serial.

In some cases the I/O devices may be *integrated* into the controller.

In the **Select Controller Device Interface** dialog, there are three types of connection. You can make a purely *physical connection* with no logical definitions. Or you can make a *standard connection* with appropriate logical definitions, from the device to all “reachable” processors through the selected control unit. In this

most common type of connection, the device is defined to all control units in the controllers, any connected processors, and all partitions in any connected processors. Alternatively, you can customize the logical definition attributes yourself by making a *custom connection*, first selecting the specific device and control unit for which definitions will be made.

## Creating a String under a Controller

Double-clicking on a controller in the configuration diagram opens the **Controller** dialog. Alternatively, choose **Controller...** from the **Edit** menu, and select the desired controller from the list which appears. Select the **Create...** button in the Strings/Devices section to display the **Create String** dialog. Fill in the information and press **OK**. Strings and their I/O devices created from the **Controller** dialog are not automatically connected and defined to the selected controller. Instead, the **String** dialog appears, where you can choose how to connect the string's interfaces.

If there is more than one physical description possible for the string, pressing **OK** will first display the **Choose Physical Description** dialog before the connection dialog.

## Selecting an Existing String under a Controller

Double-click on the desired controller to open the **Controller** dialog. The Strings/Devices section in the dialog lists any strings/devices connected to the controller through its device interfaces. If I/O devices have no physical string (they are integrated into the controller), the “virtual strings” containing them are displayed.

Select a string/device and press the **Edit...** button to display the **String** dialog. You can then open the **Select Controller Device Interface** dialog by selecting one or more string interfaces and pressing the **Connect...** button.

Note that you can also open the **String** dialog by choosing **String...** from the **Edit** menu, or by double-clicking on a string in the configuration diagram.

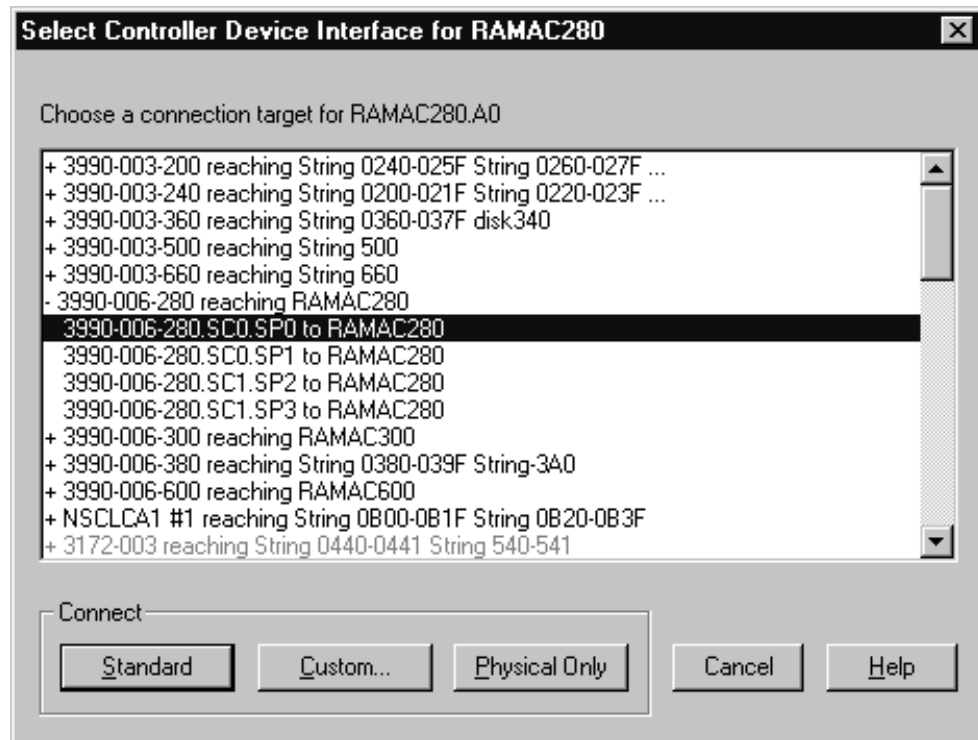


Figure 83. Select Controller Device Interface Dialog

## Connecting the String to a Controller Device Interface

Once you have displayed the **Select Controller Device Interface** dialog (see “Selecting an Existing String under a Controller” on page 130), you can select a controller device interface as the target to which you wish to connect the selected string interface(s).

The list box lists all device interfaces on controllers that are available to connect to the selected string interface(s). Double-click on a controller with a plus (+) sign to expand it to display all possible device interfaces for selection. Double-click on a controller with a minus (-) sign to contract it.

Invalid targets (device interfaces or controllers containing device interfaces which cannot reach any valid control units) are disabled. The validity of control units for connection is determined from HCD.

You can also choose which type of connection to make: physical, standard, or custom.

### Making a Physical Connection

Select a controller device interface from the list box in the **Select Controller Device Interface** dialog and press the **Physical Only** button. This option will connect the selected devices to the controller. However, no logical definitions are created between the devices and all processors connected to the controller.

### Making a Standard Connection

Select a controller device interface from the list box in the **Select Controller Device Interface** dialog and press the **Standard** button. If there is only one control unit in the segment of the selected controller, this option will connect the selected devices

to the controller. HCM will automatically create the necessary logical definitions between the devices and all processors connected to the controller, using standard values. The standard values are determined by HCD and depend on the UIMs for the control units or devices involved, the type of CHPIDs involved, and existing connections. If standard values cannot be determined, HCM proceeds as if the **Custom...** button was pressed.

If there is more than one control unit in the segment of the selected controller, the **Reachable Control Units** dialog appears to allow you to specify the control unit(s) to which to connect. Add the physically reachable control units that you wish to include in the connection to the Include list and press **OK**. HCM makes the connection and all appropriate logical definitions.

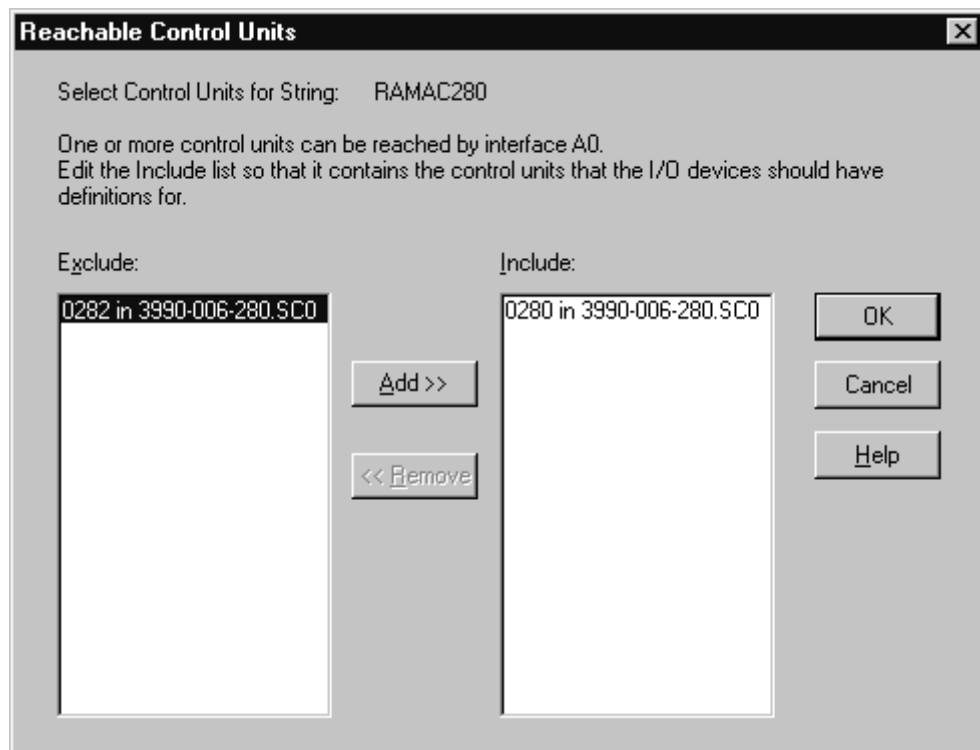


Figure 84. Reachable Control Units Dialog

### Making a Custom Connection

Select a controller device interface from the list box in the **Select Controller Device Interface** dialog and press the **Custom...** button. This option will display the **Affected I/O Devices** dialog to allow you to select one or more devices for which to make the device <=> processor definitions.

Note that you can view control unit numbers, serial numbers, VOLSERS, descriptions, etc., for the devices in the Affected I/O Devices list box depending on the selection made in the **Columns** dialog.

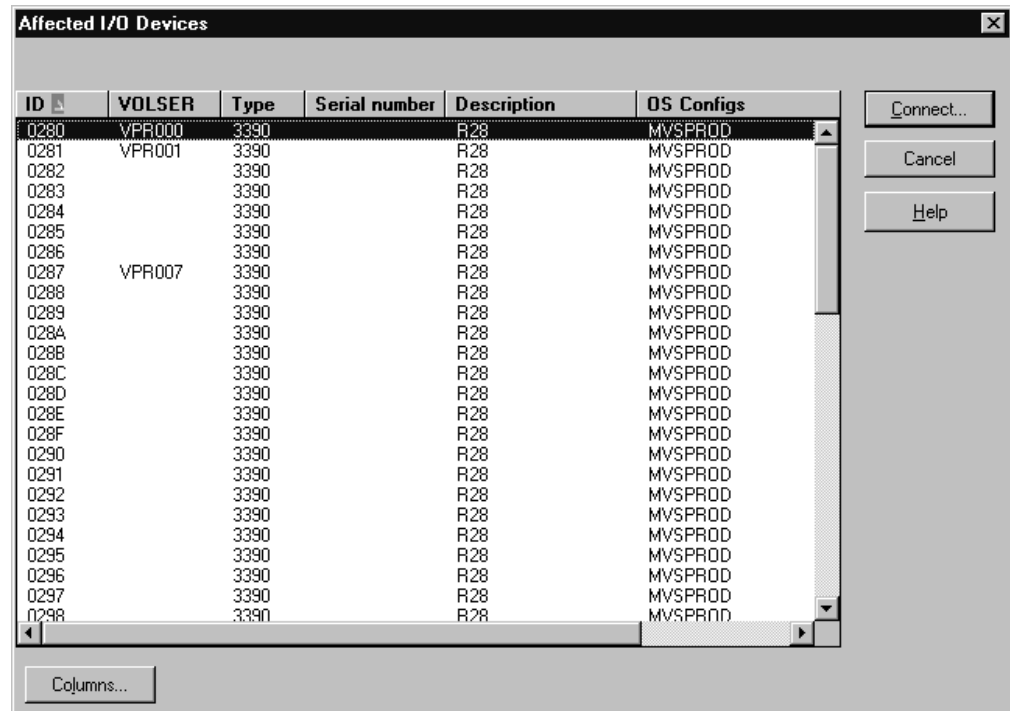


Figure 85. Affected I/O Devices Dialog

After you selected one or more devices, press the **Connect...** button. If there is more than one control unit in the controller segment, the **Reachable Control Units** dialog opens. Add the physically reachable control units that you wish to include in the connection to the Include list and press **OK**. The **I/O Device <=> Processor Definition** dialog appears. Otherwise, HCM opens the **I/O Device <=> Processor Definition** dialog directly.

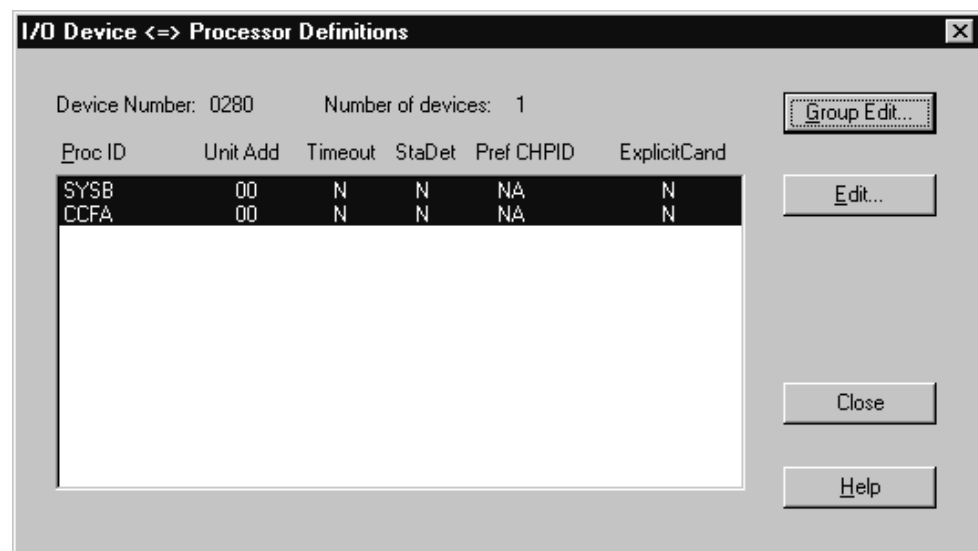


Figure 86. I/O Device <=> Processor Definitions Dialog

The **I/O Device <=> Processor Definition** dialog lists the parameters for the connection between this control unit and each processor to which it is defined. Select one or more processors and press the **Edit...** or **Group Edit...** button. The

**Edit I/O Device <=> Processor Definition** dialog appears which lets you edit the specified logical definition. If you pressed **Edit...**, this dialog will appear once for each selected processor. If you pressed **Group Edit...**, the dialog appears only once and any changes you make affect all the selected processors.

Figure 87. Edit I/O Device <=> Processor Definitions Dialog

In this dialog, you can modify the attributes of the logical definition for the selected device(s), control unit and processor(s). Press the **Update** button to save your changes and close the dialog. Press the **No Change** button to close the dialog without making any changes to the device <=> processor definition.

**Tip:**

There is an alternative way to access the **Edit I/O Device <=> Processor Definition** dialog for an existing device <=> processor link that does not involve making a connection between a device and controller. Double-click on a string to open the **String** dialog. Press **I/O Devices...** to open the **I/O Device List** dialog. Select a device(s) and press the **Dev<=>Proc...** button. The **I/O Device <=> Processor Definition** dialog appears; you can then select a processor(s) and press **Edit...** or **Group Edit...** to open the **Edit I/O Device <=> Processor Definition** dialog.

## Disconnecting the String Interface from a Device Interface

Open the **Strings** dialog by double-clicking on a string in the configuration diagram, or by choosing **String...** from the **Edit** menu. Alternatively, double-click on a controller to open the **Controller** dialog, then select a string from the String/Devices section and click on **Edit...** to open the **String** dialog. Select the connected string interface(s) from the Interfaces list box and press the **Disconnect** button. HCM will ask you for confirmation before disconnecting.

A *disconnection* involves physically disconnecting the string interface from the controller and deleting any logical definitions between the devices and any control units and processors that can no longer be physically reached.

---

## Connecting Controllers to Processors

Controllers connect devices to processors. Controllers can be daisy chained, making all connected processors physically reachable to all attached devices.

More specifically, the *channel interface* on the top of a controller can connect to a CHPID on a processor. This connection may be direct, or it may be through ESCON or FICON switches, crossbar switches, cabinet patchports, converters, or daisy chained controllers. The connection between controller and processor may be parallel (bus & tag) and/or serial. Converters are automatically added as necessary.

Connections between serial channel interfaces on controllers and serial CHPIDs form *fiber links*. Initially, the fiber link comprises a direct connection, but it can also include patchports, trunks, and jumper cables. See “Editing Fiber Links” on page 160 for more details.

In the **Select Connection Target(s)** dialog, you can ask HCM to make a *physical connection* or a *standard connection*, where you can also adjust several parameters to your needs. The physical connection is a simple physical connection, with no logical definitions. The standard connection creates logical definitions between the controllers and reachable processors. This is the most common type of connection: all control units are defined to the CHPID and processor, and all devices connected to the controller are defined to the processor and all its partitions. Depending on whether you connect a controller directly to a CHPID or to a switch, the subsequent dialogs may differ. In the first case, the **Edit Control Unit <=> Processor Definitions** dialog might appear, where you can specify some parameters in order to customize selected logical definitions. Note that default parameters are always provided in this dialog, which can then be modified. In the second case, that is, when you connect a controller with a port of a switch, the **Processor and CHPID Connections** dialog appears. There, you can customize your connections by pressing the **Attributes ...** button. Again, the **Edit Control Unit <=> Processor Definitions** dialog then appears, where you can adjust the default parameters to your needs.

## Selecting a Channel Interface for a Controller

Open the **Controller** dialog by choosing **Controller...** from the **Edit** menu and selecting a controller from the resulting list, or by double-clicking on the controller in the configuration diagram. Select a channel interface for the controller and press the **Connect...** button to open the **Select Connection Target(s)** dialog. This dialog allows you to connect the controller channel interface to a target interface, such as a processor CHPID, switch port or crossbar control unit interface. The dialog leads to others which allow you to create any necessary logical definitions for the physical connection.

## Connecting the Channel Interface to a CHPID

Connecting a channel interface to a CHPID creates a *physical route* between control units in the controller and the processor. If there is an ESCON or FICON switch or crossbar switch in the connection, the control units may access more than one processor. See “Connecting Crossbar Switches” on page 166 and “Connecting Switches to Processors or Other Switches” on page 142 for details.

**Note:** Although the rest of this section deals with connecting the controller channel interface to a processor CHPID, you can connect the controller to a crossbar switch or an ESCON or FICON switch which eventually leads to the processor CHPID, using the **Select Connection Target(s)** dialog.

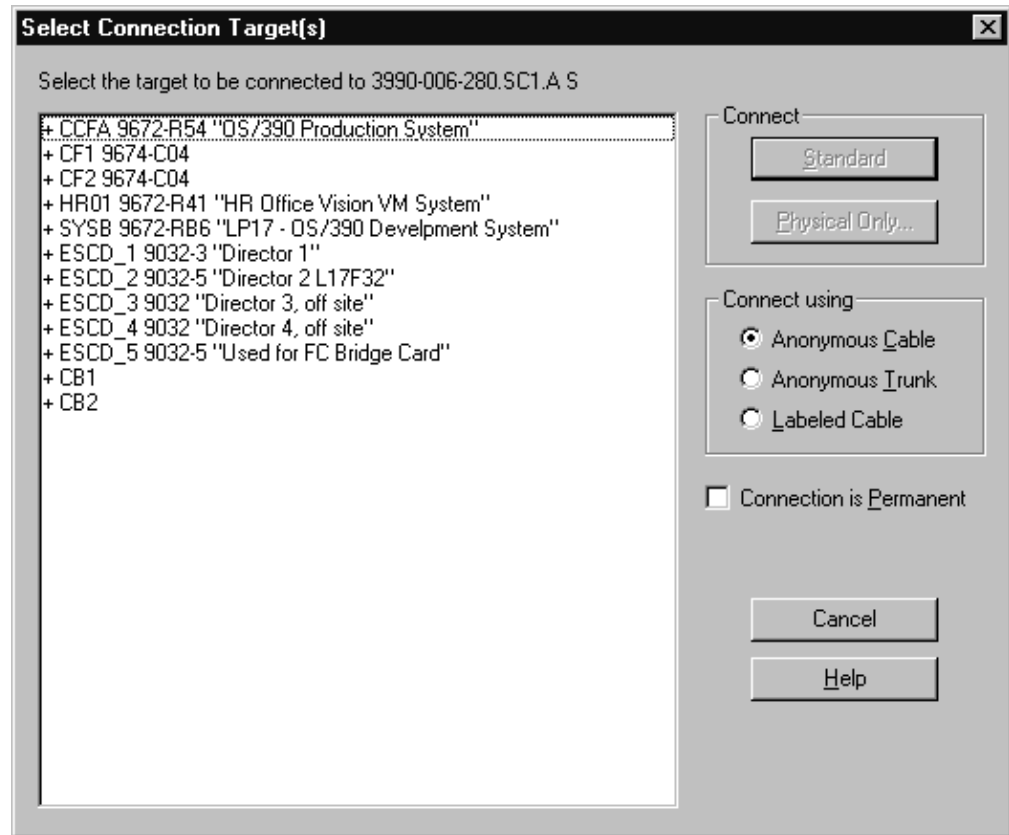


Figure 88. Select Connection Target(s) Dialog

Open the **Select Connection Target(s)** dialog by selecting a channel interface and pressing the **Connect...** button in the **Controller** dialog.

**Note:** If the selected controller is part of a switch, and you accessed the **Controller** dialog from the **Edit Switch** dialog, pressing the **Connect...** button displays the dialog that would appear if you had already pressed the **Standard** button in the **Select Connection Target(s)** dialog. (That is, the **Select Connection Target(s)** dialog is skipped.)

Select a processor CHPID as the target interface to which to connect. The Connection target list box lists all physical connection targets to which you can connect. Double-click on a target object with a plus (+) sign to expand it to display all possible target interfaces. Double-click on a target with a minus (-) sign to contract it. Note that double-clicking on a target interface triggers the **Standard** connect button. Invalid targets are disabled.

If you are connecting the channel interface to a CHPID that is already connected to another controller, pressing **Standard...** or **Physical Only...** will first display the **Position Interface** dialog. You can position the channel interfaces on the target object before connecting. See "Positioning Objects Along Daisy-Chain Connections" on page 128 for more information on the **Position Interface** dialog.

After selecting the target CHPID, you choose which type of connection to make: physical or standard (customization of the connection is possible here). Depending on whether a connection should be established directly to a CHPID or to a switch port, further user interaction differs. Let's consider first that a connection should be established between a controller and a port of a switch. Depending on the user interaction on the **Processor and CHPID Connections** dialog, HCM uses standard values for the attributes of the connection or the ones that the user has specified in the **Edit Control Unit <=> Processor Definitions** dialog, which appears after pressing the **Attributes...** button in the **Processor and CHPID Connections** dialog. The standard values for the attributes are determined by HCD and depend on the UIMs for the control units or devices involved, the type of CHPID involved, and existing connections. In the second case, where a connection between a controller and a CHPID is considered, HCM allows you to customize the attributes of selected logical definitions via the **Edit Control Unit <=> Processor Definitions** dialog.

### **Making a Physical Connection**

Select a CHPID from the Connection target list box and press the **Physical Only...** button in the **Select Connection Target(s)** dialog. This option will connect the selected controller to the processor. However, no logical definitions are created between the controller and processor. Note that this will cause the connection to be colored as a logical/physical inconsistency on the diagram. See "Receiving Visual Warnings" on page 43 for more information.

### **Making a Standard Connection**

Select a CHPID from the Connection target list box and press the **Standard ...** button in the **Select Connection Target(s)** dialog. This option makes the physical connection and all appropriate logical definitions. Depending on whether you want to establish a connection between a controller and a CHPID or a port of a switch, this option will take you through a series of dialogs, depending on certain conditions, to allow you to edit control unit <=> processor logical definitions.

Considering that a connection between a controller and a port of a CHPID is planned, the following dialogs might appear:

- **Affected Control Units**
- **Processor and CHPID Connections**
- **Position Interface**
- **Control Unit <=> Processor Definitions**
- **Edit Control Unit <=> Processor Definitions** dialog

In the simplest case of connecting a controller with one control unit with one channel interface to a CHPID that has no physical connections, clicking **Standard...** might immediately establish the connection without further user interaction.

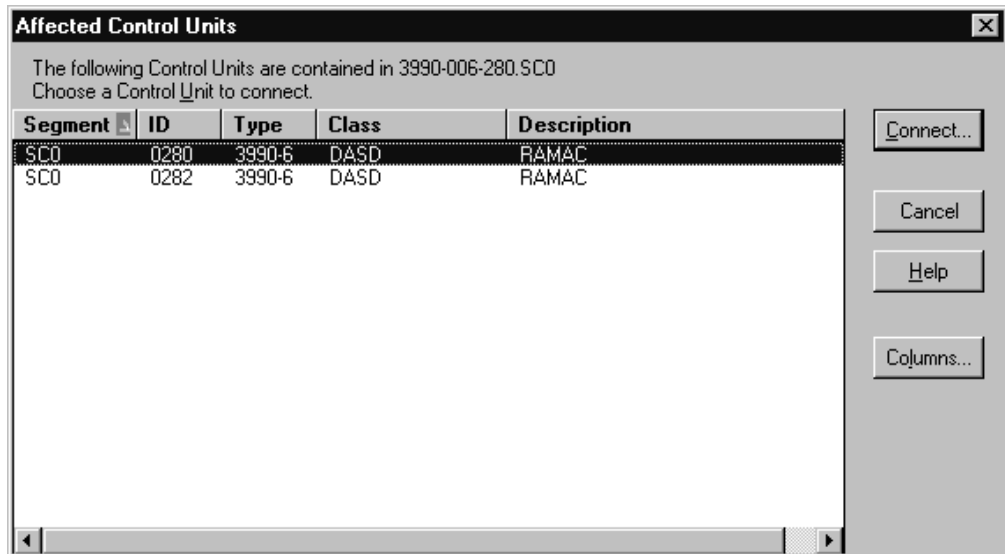


Figure 89. Affected Control Units Dialog

The **Affected Control Units** dialog appears if the selected controller channel interface can be reached by more than one control unit. Select a single control unit to define to the processor(s) and press the **Connect...** button.

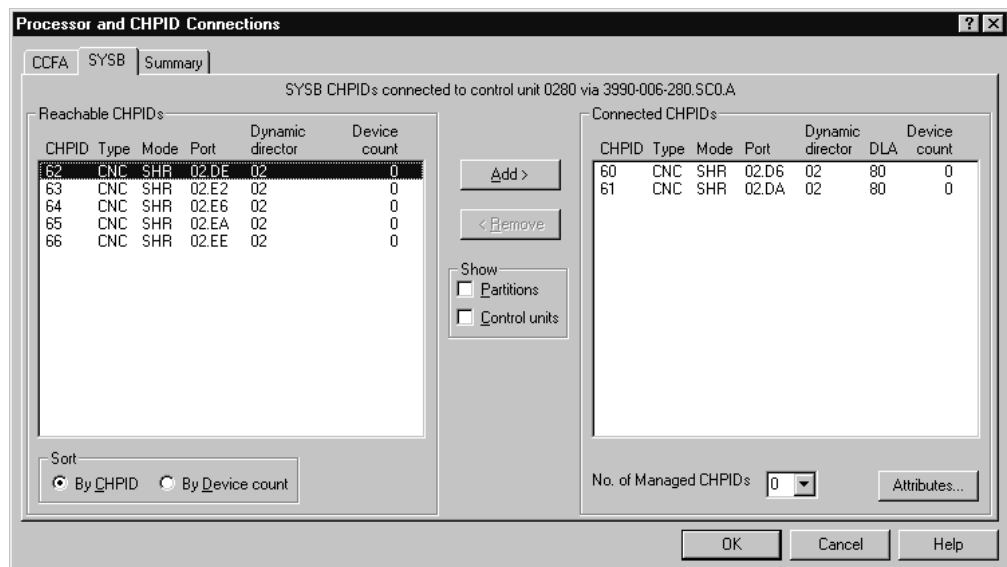


Figure 90. Processor and CHPID Connections Dialog

The **Processor and CHPID Connections** dialog appears if you connect the control unit via a switch. You can select the available channel paths of a processor by clicking on the appropriate processor tab in the dialog. The summary tab in this dialog gives an overview of which CHPIDs the connection will be made to. The interface you are connecting is shown on each individual tab. Selecting the **Show partitions** check box displays additional lines of text showing access and candidate lists for the CHPIDs in each list box entry. Selecting the **Show control units** check box displays an additional line of text for each attached control unit below the CHPID. This line will show the control unit number, its type and attached device ranges with their types.

If more than one CHPID can be reached, you can then include or exclude certain CHPIDs in the connection and press **OK** before specifying logical definition attributes.

Besides static connections, a control unit can also have connections to manageable channel paths. In order to indicate the maximum number of manageable channel paths allowed to connect between the processor to which a connection is to be established and the control unit of interest, enter the correct number in the respective entry field on this dialog. The usual configuration rules apply.

The **Position Interface** dialog appears if the selected CHPID is already connected to another controller (daisy chaining). This dialog allows you to position the channel interface on the daisy chain. See “Positioning Objects Along Daisy-Chained Connections” on page 128 for more information.

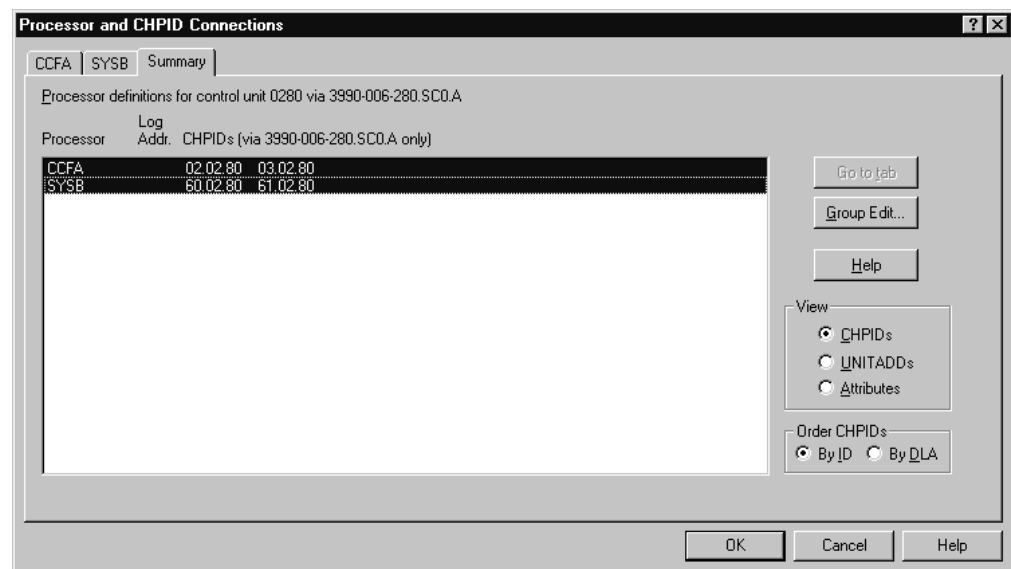


Figure 91. Processor and CHPID Connections Dialog

If you click on the Summary tab of the **Processor and CHPID Connections** dialog, you obtain the processor definitions for the control unit under focus. You can then specify the processor(s) for which you will edit the control unit  $\Leftrightarrow$  processor logical definitions and press the **Group Edit ...** button.

Ultimately, the **Edit Control Unit  $\Leftrightarrow$  Processor Definitions** dialog appears allowing you to edit the control unit  $\Leftrightarrow$  processor logical definitions for the selected control unit and one or more selected processors. This dialog appears also for selected logical definitions when a connection has to be established directly between a controller and a CHPID without going through a switch.

An asterisk '\*' on the Summary tab of the **Processor and CHPID Connections** dialog indicates that the control unit of interest has connections defined to manageable channel paths of the indicated processor(s). This means that the control unit might be reachable by more than the statically defined channel paths when the system is up and running.

### Editing Logical Definitions Between Controller and Processor

Edit the attributes for the control unit  $\Leftrightarrow$  processor logical definition. Press the **Update** button to validate the changes and return to the calling dialog.

Alternatively, pressing the **No Changes** button will allow you to leave the dialog without creating all the required definitions. This may produce a physical-logical inconsistency.

Figure 92. Edit Control Unit <=> Processor Definitions Dialog

You can specify or edit unit addresses and ranges when more than one range exists for the selected control unit. Click on the **Unitadds...** button to open the **Unit Address Ranges** dialog.

**Tip:**

There is an alternative way to access the **Edit Control Unit <=> Processor Definition** dialog for an existing control unit <=> processor definition that does not involve making a connection between a controller and processor. Double-click on a controller to open the **Controller** dialog. Press **Control Units...** to open the **Control Unit List** dialog. Select a control unit and press the **CU<=>Proc...** button. The **Control Unit <=> Processor Definitions** dialog appears; you can then select a processor(s) and press **Edit...** or **Group Edit...** to open the **Edit Control Unit <=> Processor Definition** dialog.

## Disconnecting the Channel Interface from a CHPID

Open the **Controller** dialog by double-clicking on a controller in the configuration diagram, or by choosing **Controller...** from the **Edit** menu. Select the connected channel interface(s) from the Interfaces list box and press the **Disconnect** button. HCM will ask you for confirmation before disconnecting.

A *disconnection* involves logically disconnecting any control units from any CHPIDs that were only reachable via the controller channel interface, as well as physically disconnecting.

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## Connecting Controllers to Controllers (PPRC Connections)

Controllers can be connected to other controllers either directly via a point-to-point connection, or via one or more switches. Such connections are used for PPRC connections, and they can be defined and documented with HCM. Creating a PPRC connection in HCM consists of two steps:

1. The physical connections need to be established. Therefore, connect the channel interfaces either via a point-to-point connection or via one or more switches with each other.
2. Create a PPRC connection consisting of up to 8 PPRC links using HCM's PPRC utility reachable via the **PPRC Connections ...** menu item in the **Edit** menu.

"Scenario V – Establish a PPRC Connection consisting of several PPRC Links" on page 274 runs a scenario in which a PPRC connection is set up in detail, consisting of point-to-point and switched links.

### Physically Connecting a Channel Interface to a Channel Interface of another Controller

Before you can create a PPRC connection in HCM, the physical connections must be available to HCD. Connecting a channel interface of a controller directly to a second channel interface creates a *physical route* between two controllers. After defining such a connection, no logic connection has been established. When you define connections between channel interfaces and switches, you also establish the physical environment for the PPRC connection regardless whether one or more switches are involved.

First, consider the case of establishing a point-to-point connection via two channel interfaces. The process of connecting two channel interfaces with each other is similar to connecting a channel interface to a CHPID (see "Connecting the Channel Interface to a CHPID" on page 135). In the **Controller** dialog, select a controller interface and press the **Connect ...** button. In the following **Select Connection Target(s)** dialog, select an interface of one of the controllers in your configuration to which you want to establish a point-to-point connection, and press the **Physical only ...** button. Note that you can only establish a physical connection, but no logic connection, when connecting two channel interfaces with each other, hence, the **Standard** button is disabled when you select a channel interface in the **Select Connection Target(s)** dialog.

Consider now the case of a chained or cascaded connection between two channel interfaces. Again, this process is similar to connecting a channel interface to a CHPID. Here, you have to connect the involved controller interfaces with ports of a switch. For details, please refer to "Connecting the Channel Interface to a CHPID" on page 135. In case of a chained switch environment, you also have to connect the switches with each other. For details, please refer to "Connecting Switches to Processors or Other Switches" on page 142.

### Creating a PPRC Connection

After having established physical connections between the involved objects of a PPRC connection, you can create the PPRC connection itself. Open the **PPRC Connections** dialog via the **Edit** menu and press the **Create** button. This will lead you to the first page of the **Create PPRC Connections** dialog in which you can select the primary (source) subsystem. Press **Next** to open the second page of this utility on which you can select the secondary (target) subsystem to be connected to the primary subsystem. After pressing the **Next** button again, you are prompted on

the third page of the utility to choose the interfaces used to connect the selected subsystems. Here, you can specify up to eight single PPRC links. When you are finished selecting the interfaces, press **Next** once more to arrive at the last page of the utility. Here, you can enter the remaining parameters for each PPRC link. When you have specified all needed values, press the **Finish** button to complete your PPRC connection.

## Editing a PPRC Connection

You can edit existing PPRC connections and modify them accordingly. Open the **PPRC Connections** dialog via the **Edit** menu. Select a PPRC connection listed in the dialog, and press the **Edit** button which leads you to the first page of the **Edit PPRC Connections** utility. Here you can select which interfaces of the involved controllers should participate in a PPRC connection. After you have selected the interfaces under focus, press the **Next** button which leads you to the second page of the **Edit PPRC Connections** utility. Here, you can adjust the remaining parameters for each PPRC link. When you have specified all needed values, press the **Finish** button to complete your PPRC connection.

## Importing and Exporting PPRC Connections

You can edit existing PPRC connections and modify them accordingly. Open the **PPRC Connections** dialog via the **Edit** menu. Select a PPRC connection in the dialog, and press the **Import/Export ...** button. This will lead you to the **Import/Export PPRC Connections** utility. On the first page of that utility, you can select whether to export or to import PPRC connections. After pressing the **Next** button, you can select whether you want to process CESTPATH commands or GEOPARM control statements. On the third page, you can specify a filename for import and export, depending on which action you have selected on page one of the wizard.

## Deleting a PPRC Connection

You can delete existing PPRC connections by opening the PPRC Connections dialog via the Edit menu. Select a PPRC connection listed in the dialog, and press the Delete button. A PPRC link is also deleted when a controller interface that participates in that particular PPRC link is disconnected either from the target controller interface in case of a point-to-point PPRC link, or from the switch port in the chained case.

## Disconnecting a Channel Interface from a Channel Interface

Disconnecting a channel interface from a channel interface works exactly the same as disconnecting the channel interface from a CHPID, see “Disconnecting the Channel Interface from a CHPID” on page 140. After having disconnected a controller interface from another controller interface or from a switch port, PPRC links in which that controller interface was involved are deleted.

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## Connecting Switches to Processors or Other Switches

You can insert a switch into the connection between controllers and processors. The switch *port* can connect upwards to either a processor CHPID or another switch port, using the **Switch** and **Select Connection Target(s)** dialogs. When you connect controllers (or crossbar switches) to the ESCON or FICON switch, you also use the **Select Connection Target(s)** dialog. If you connect the controller to a switch which is already connected to several CHPIDs, the controller (and any already connected I/O devices) can establish communication with all reachable processors.

ESCON and FICON switch ports are serial interfaces, unlike crossbar switch interfaces which are parallel (bus and tag). Switches cannot connect upwards to crossbar switches, but crossbars can connect upwards to switches (see “Connecting Crossbar Switches” on page 166 for more details).

To connect a switch, open the **Switch** dialog by double-clicking on a switch in the configuration diagram. Alternatively, choose **Switch** from the **Edit** menu and select the switch from the resulting list. Select a switch port(s) from the Ports list box and press the **Connect...** button. The **Select Connection Target(s)** dialog appears, allowing you to select a target interface for connection.

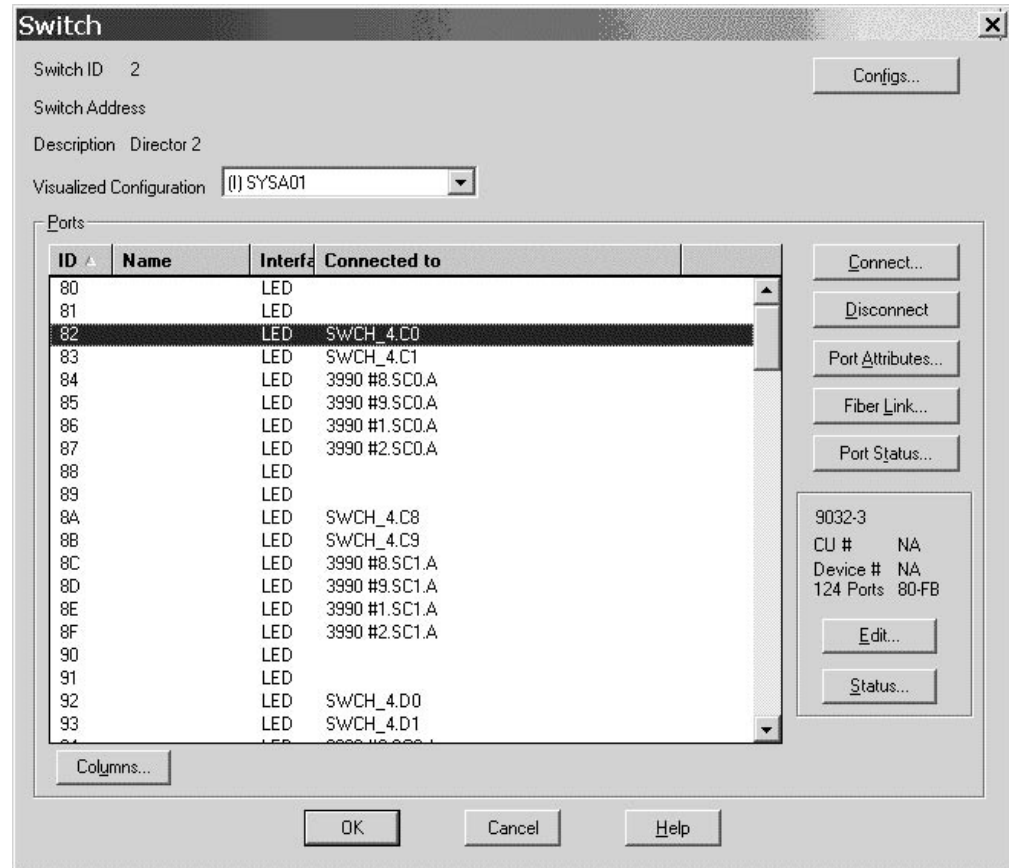


Figure 93. Switch Dialog

Select a processor CHPID or switch port in the list box. You can double-click on a target object with a plus (+) sign to expand it to display its interfaces; double-click on a target with a minus (-) sign to contract it. Invalid targets are disabled. The Suggest option explains why a disabled target is invalid; the Always Suggest check box specifies that the targets are examined for validity whenever this dialog is opened.

After you have selected the target, press the **Physical Only** button. Alternatively, double-click on the target interface.

Pressing the **Physical Only** button in the **Select Connection Target(s)** dialog causes HCM to attempt to make the physical connection between the selected switch port and target. If you are connecting to a CHPID, HCM will automatically set up the

CHPID dynamic switch attribute. If the CHPID already has a different dynamic switch defined, you will be asked to confirm the change. See “Editing a CHPID” on page 84 for more details.

## Disconnecting the Switch Port from a Target Interface

Open the **Switch** dialog by double-clicking on a switch in the configuration diagram, or by choosing **Switch...** from the **Edit** menu. Select the connected switch port from the Ports list box and press the **Disconnect** button. HCM will ask you to confirm the disconnection before doing it.

## Connecting CHPIDs via CTC Connections

You can create a CTC (channel to channel) connection between two CHPIDs on the same or different processors, either directly or through a switch. When connecting through a switch, both CHPIDs must be able to access the same dynamic switch. One CHPID must be CNC or FCV, the other CTC in case of an SCTC connection. For FCTC connections, two FC CHPIDs have to be connected.

HCM considers a CTC connection as a single entity comprising selected control units and I/O devices connected to the CHPIDs. The following diagram represents two CTC connections, connecting two CHPIDs through a switch. Note that the CTC controllers and devices are not explicitly shown.

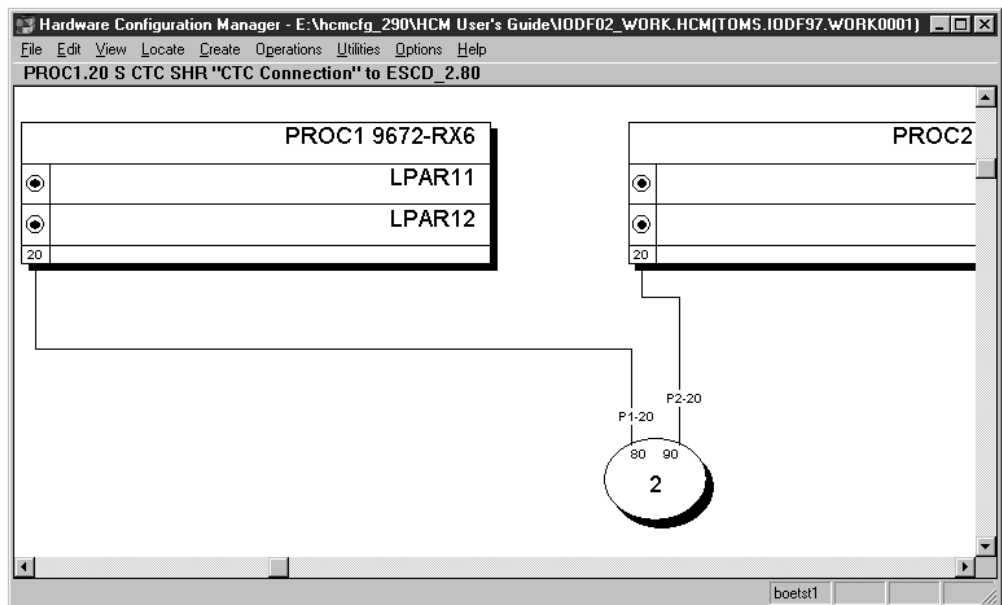


Figure 94. CTC Connection Between Two CHPIDs on Different Processors Through a Switch

## Creating a CTC Connection

Choose **CTC Connection...** from the **Create** menu or press **Create...** in the **CTC Connections** dialog to open the **Create CTC Connection** dialog. Select the two CHPIDs at either end of the CTC connection by pressing the appropriate **CHPID...** button and choosing a CHPID from the resulting list box. Double-click on a processor in the list with a plus (+) sign to expand it to display all possible target interfaces (CHPIDs); double-click on a processor with a minus (–) sign to collapse it. Select a CHPID and press **OK**; alternatively, double-click on the CHPID.

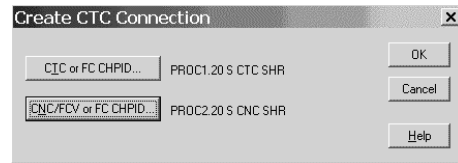


Figure 95. Create CTC Connection Dialog

Selecting **OK** will validate whether or not the CHPIDs may be involved in a CTC connection. One of the following conditions must be met:

- Neither of the CHPIDs are physically connected to anything, (for a new point to point), or
- Both of the CHPIDs are connected to a switch, both CHPIDs have the same dynamic switch defined, and both CHPIDs have physical access to the dynamic switch either directly or via at least one port-to-port connection from the entry switch to the dynamic switch. If a CHPID is on a chained switch, and there is more than one possible route between the chained switches (that is more than one choice for the exit link address), the user will be prompted to choose one, or
- (usual case) The CHPIDs are already physically connected to each other, but neither CHPID has any control units defined, (to fix up a point-to-point).

If none of the above conditions are met, you will be informed and the dialog will remain displayed so that different CHPIDs may be chosen.

Once this has been done, the **Create CTC Connection** dialog will disappear, and be replaced with either the **Accept Proposed CTC Control Units** dialog or the **Edit CTC Connection** dialog, allowing the user to specify the control units and devices used in the connection.

## Editing a CTC Connection

Since CTC connections are not displayed as visible objects in the configuration diagram (only their cables are shown), they cannot be selected directly for editing. Choose **CTC Connections...** from the **Edit** menu to open the **CTC Connections** dialog. Select a connection from the list and press **Edit...** the **Edit CTC Connection** dialog appears. Alternatively, after you have created a CTC connection, pressing **OK** in the **Create CTC Connection** dialog automatically displays the edit dialog.

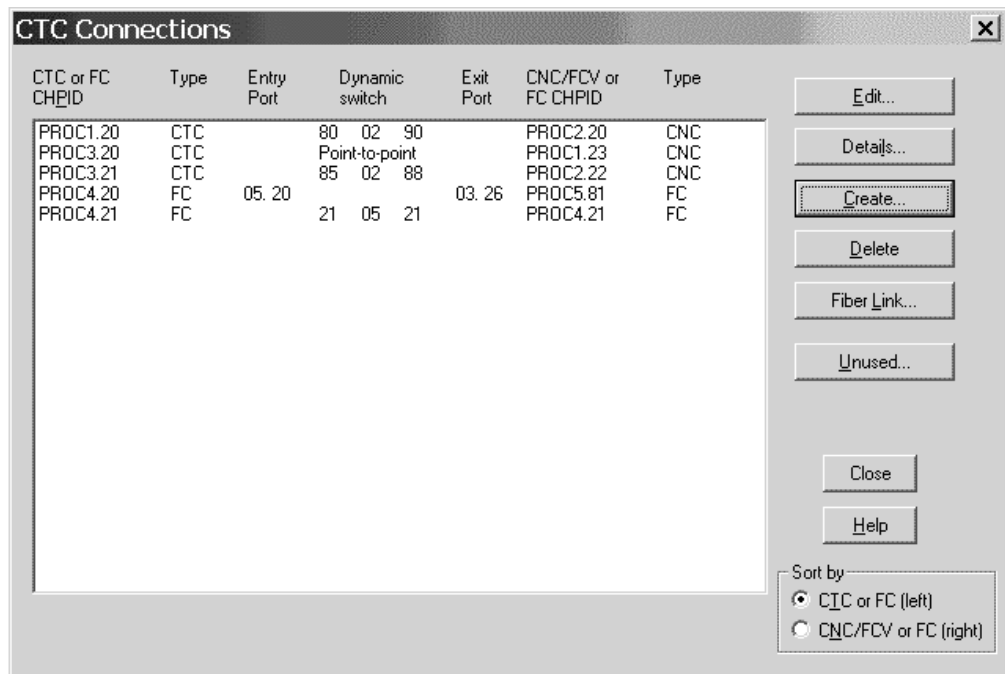


Figure 96. CTC Connections Dialog

In the **Edit CTC Connection** dialog, you can view all control units and I/O devices comprising the selected CTC connection. The dialog shows two lists, side by side.

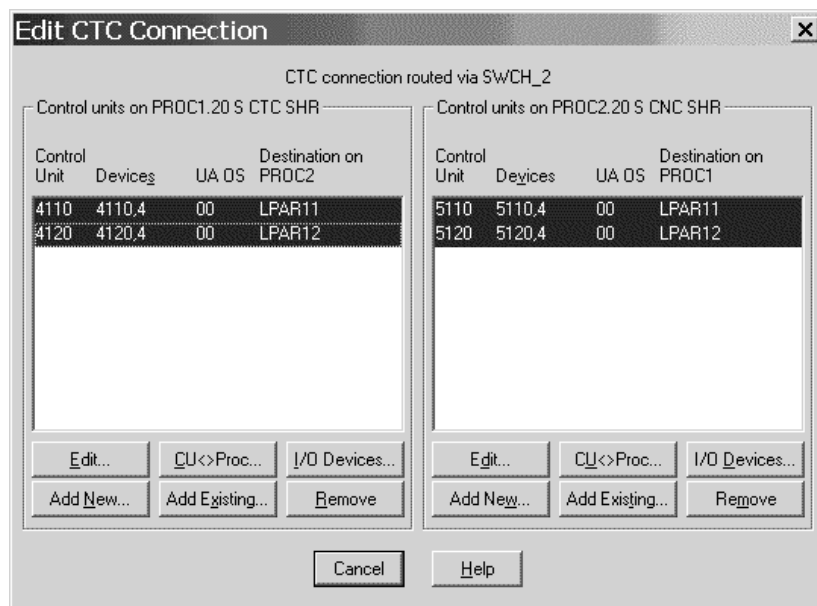


Figure 97. Edit CTC Connection Dialog

The left-hand listbox shows all of the control units connected to the CTC CHPID, or FC CHPID in case of an FCTC connection, that represent images available via the CNC or FCV CHPID, or FC CHPID in case of an FCTC connection.

**Note:** For purposes of this discussion, the term “image” refers to either a partition on an LPAR host, or the processor itself if it is running in BASIC mode.

There is at least one entry per image, even if there is no control unit connected that represents the partition, in which case all data columns except “Destination on ....” will be blank. If the control unit has a discontinuous range of devices connected to it, or if the device range is made up of a mixture of CTC and BCTC devices, then there will be one or more subentries under the main entry that show additional device ranges. For instance, if control unit 4110 had devices 4110-4113 and 4116-4117 connected (discontinuous), and control unit 4120 had devices 4120,4 (CTC) and 4124,4 (BCTC), the entries would look like this:

4110	4110,4	00	LPAR11
	4116,2	06	
4120	4120,4	00	LPAR12
	4124,4 (B)	04	

Each control unit or image comprises a single selectable row, even if it consists of multiple lines of text showing different device ranges; for instance, selecting either the 4110,4 line or the 4116,2 line will select the entire 2-line entry for CU 4110, which represents image PART11.

The right-hand listbox is identical; the only difference is that it displays all of the control units connected to the CNC or FCV CHPID, or FC CHPID in case of an FCTC connection, that represent images available via the CTC CHPID, or FC CHPID in case of an FCTC connection.

For images that have no control units to represent them, you may click **Add New...** to create new control units and devices to represent the image, or **Add Existing...** to select an existing CTC control unit that may be connected to the CHPID so as to represent the selected image. For images that have control units, you may click **Edit...** to open the **Edit Control Unit** dialog, **CU <=> Proc...** to open the **Control Unit <=> Processor Definitions** dialog, or **I/O Devices...** to open the I/O Device List dialog. You may also choose to disconnect the control unit from the CHPID (and possibly delete the control unit and its devices) by clicking **Remove**.

**Note:** The **Edit CTC Connection** dialog can sometimes be preceded by the **Accept Proposed CTC Control Units** dialog. It will appear in those cases where HCM finds that not all images in the connection are represented by control units, and where there are CTC control units already in the IODF that would be suitable to represent those images based on current usage. These control units will appear in gray in the listboxes. After you accept or reject these proposed CHPID-control unit connections, the **Accept Proposed CTC Control Units** dialog will be replaced by the normal **Edit CTC Connection** dialog.

### Viewing a Connectivity Report for a CTC Connection

Select the connection from the **CTC Connections** and press **Details...**, the **View CTC Connection Details** dialog will appear, showing all image-to-image connections showing the control units and devices that each image uses to access the other image.

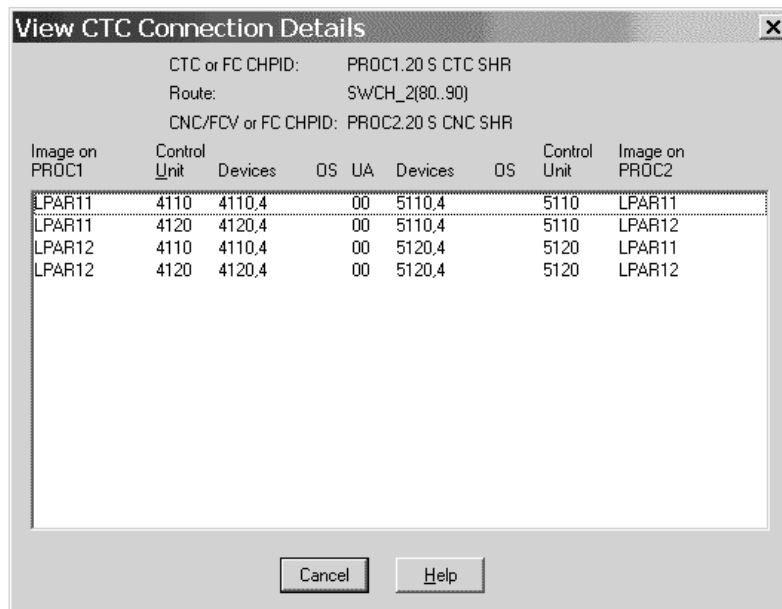


Figure 98. View CTC Connection Details Dialog

It is possible for each image-to-image connection to span multiple listbox entries. As an example, if all of the images used in the example above used 4 CTC devices and 4 BCTC devices, there would be 12 listbox entries, the first 4 showing:

LPAR11	4110	4110,4	00	5110,4	5110	LPAR12
LPAR11	4110	4114,4 (B)	04	5114,4 (B)	5110	LPAR12
LPAR12	4120	4120,4	00	5120,4	5120	LPAR11
LPAR12	4120	4124,4 (B)	04	5124,4 (B)	5120	LPAR11

Furthermore, this listbox will have entries to show devices that use unit addresses not mirrored on the destination image. These entries will show blanks in control unit and device columns on either the left or right side. To illustrate, assume LPAR12 is excluded from device 5112's explicit candidate list. The first listbox item would be split into three entries as follows:

LPAR11	4110	4110,2	00	5110,2	5110	LPAR12
LPAR11	4110	4112,1	02			LPAR12
LPAR11	4110	4113,1	03	5113,1	5110	LPAR12

This shows that LPAR11 is able to communicate to LPAR12 via unit address 02, but LPAR12 has no device defined on this UA to communicate back.

## Deleting a CTC Connection

Select the connection from the **CTC Connections** and press **Delete**. All of the control units that are connected to the CHPIDs for this connection will be disconnected. The control units that no longer have any CHPID connections will be deleted along with their attached devices.

## Editing the Fiber Links for CTC Connections

You can edit the fiber link for a point-to-point CTC connection. Open the **CTC Connections** dialog by choosing **CTC Connections...** from the **Edit** menu. Choose the point-to-point connection and press the **Fiber Link...** button to open the **Edit Fiber Link** dialog. You can then edit the composition of the Fiber link between the CHPIDs. For more details, see "Editing Fiber Links" on page 160.

Note that CTC connections through switches have two fiber links, one on each switch port. To edit those fiber links, open the **Switch** dialog by double-clicking on the switch in the configuration diagram. Select the desired switch port and click on the **Fiber Link...** button to display the **Edit Fiber Link** dialog.

### Viewing and Deleting Unused CTC Control Units, Devices, and Connections to CHPIDs

It is possible that the IODF contains CTC control units, devices, or connections between CHPIDs and CTC control units that cannot be attributed to any valid CTC connection. This can happen in the following circumstances:

- Unconnected CTC control units or devices were created using HCD followed by an IODF load or resync.
- Connections via switches were made using HCD without specifying CHPID-port or port-CU links followed by an IODF load or resync.
- Only one side of a logical CTC connection was made using either HCD or HCM.
- An action within either HCD or HCM was made that affects the validity of existing CHPID-control unit connections, such as unlinking a port from a CHPID or control unit, deleting a partition involved in a CTC connection, or changing the mode of a CHPID involved in a CTC connection from shared to non-shared or vice-versa.

Under these circumstances, the **Unused...** button will appear on the **CTC Connections** dialog. Clicking this button will open the **View Unused CTC Control Units, Devices, and CHPID Connections** dialog.

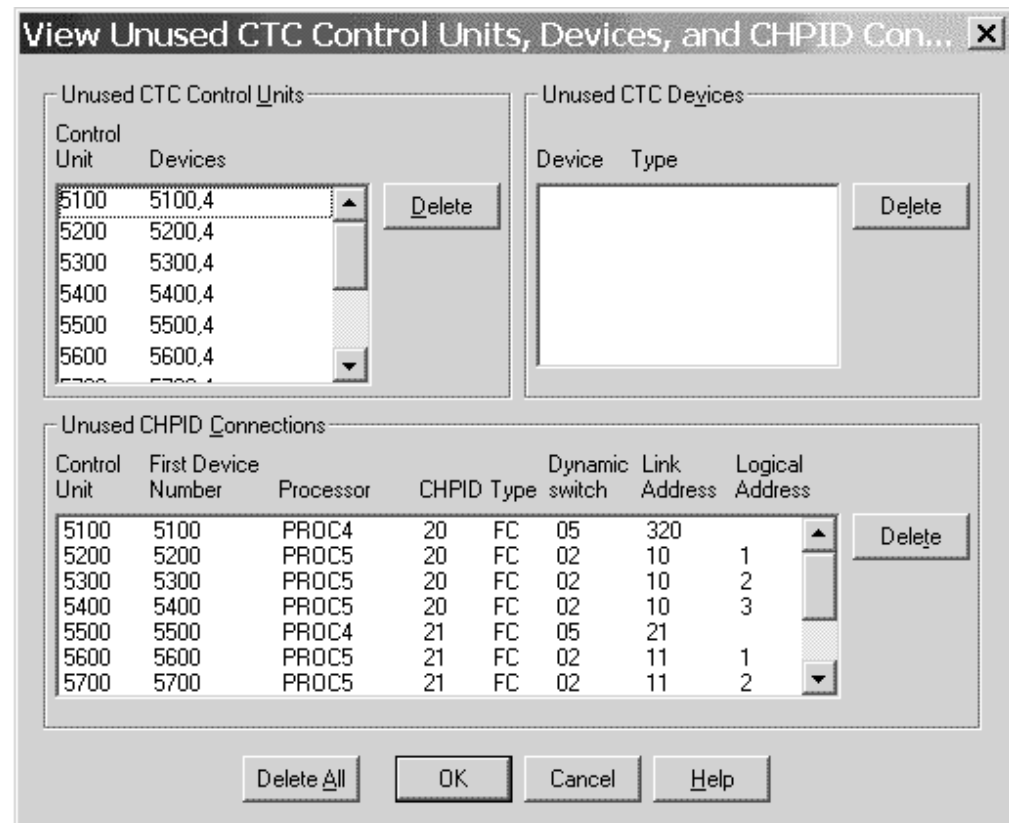


Figure 99. View Unused CTC Control Units, Devices, and CHPID Connections

All of the invalid (that is not involved in a valid CTC connection) CTC-related IODF objects will appear in this dialog. Usually the easiest way to recover from these situations is to click **Delete All** to get rid of the invalid items, and re-create the CTC connections that were affected.

To prevent this dialog from ever having to make an appearance, the following precautions should be adhered to:

- Before loading an IODF, make sure that all control units and CHPIDs involved in CTC connections via switches have appropriate links to switch ports, and that all control units involved in new point-to-point CTC connections have serial numbers specified to match up the two sides of the connection. Also ensure that unconnected CTC control units and devices are deleted. See also “Preparing the IODF” on page 58.
- Whenever you create or modify a CTC connection in HCM, make sure that both CHPIDs (that is both sides of the **Edit CTC Connection** dialog) have one control unit connected to represent an image on the other CHPID.

## Validating CTC Connections

Several actions can influence your CTC connections. Even when you have correctly set up a CTC connection using HCM, actions in your configuration that you perform after defining your CTC connection might influence your CTC connection in a way so that the CTC connection does no longer work. Among these actions are the following:

- Updating the access/candidate lists for a CHPID
- Changing a CHPID’s mode (SHR/DED)
- Changing an LPAR number
- Deleting an LPAR
- Adding an LPAR
- Disconnecting/reconnecting a CHPID
- Deleting a CHPID
- Deleting a switch.

Whenever you make one of these actions, you should verify your CTC connections in HCM. For instance, when you create a CTC connection via HCM, the CUADD values representing logical partitions are automatically correctly set by HCM/HCD at the time the CTC connection is created. If you now modify the LPAR number, the CUADD value stored does no longer represent the chosen logical partition, as the LPAR number and CUADD no longer coincide. Though correctly defined before, the CTC connection will no longer work because of an action that influences the CTC connection.

### CTC Connection Report

HCM offers you the possibility to create a CTC connection report via the **Print Reports** dialog, reachable via the **File** menu. You can see an example of such a report in “Sample Reports and Context Diagrams” on page 196 (Channel-to-Channel Connections). The CTC connection report contains information about all CTC connections known to HCM in your configuration. At least before building a production IODF, use this report to carefully verify that all the CTC connections that you have defined before, are still existing as previously defined.

### View CTC Connection Details

Besides the HCM CTC connection report, you can also verify the CTC connections defined in the configuration via the **CTC Connection Details** dialog, see Figure 98 on page 148

on page 148. With this dialog, you can view the connectivity details for a selected CTC connection. This dialog shows you information about the involved processor(s) and channel paths, gives details about the route itself, and provides insight in the used images on the processor, the used CTC control units and CTC devices. In general, if blanks appear in any column in the list box (with the exception of the OS columns), then there is some gap in the connectivity and the two images will not be able to communicate using the unit address shown. Even though CTC definitions have been correctly defined before, you might find gaps indicating that some mismatch occurs due to one of the above mentioned actions.

### **View Unused CTC Control Units, Devices, and CHPID Connections**

Use this dialog to view (and clean up, if necessary) unused CTC control units and devices, or connections from CHPIDs to CTC control units that are not used in any CTC connection. To display this dialog, press the **Unused...** button on the **CTC Connections** dialog. Note that this button is available only if there are unused items to examine. When using HCM to define CTC connections, this dialog will only be available if CTC connections are incomplete. Therefore, the appearance of the **Unused...** button on the **CTC Connections** dialog serves as an indication that something is amiss with the logical definitions that make up the configuration's CTC connections. See also "Viewing and Deleting Unused CTC Control Units, Devices, and Connections to CHPIDs" on page 149.

### **Create / Establish CTC Connections after loading an IODF**

After loading an IODF, HCM is able to detect CTC connections. In general, HCM recognizes CTC connections if all control units composing a CTC connection through a switch are connected to switch ports. Point-to-point connections are recognized if the involved control units have the same serial number.

In case the involved control units of a point-to-point CTC connection do have different serial numbers, HCM can not detect that CTC connection. In order to establish such a CTC connection so that also HCM recognizes these CTC connections, you can do the following steps. Note that it is assumed here that correct point-to-point connections have been defined in the IODF via HCD.

- Create the CTC connection under focus via the **CTC Connections** dialog where you press the **Create...** button in order to obtain the **Create CTC Connection** dialog.
- In the **Create CTC Connection** dialog, select the CHPIDs that are involved in the CTC connection, and press the **OK** button.

Now, the **Accept Proposed CTC Control Units** dialog appears showing the CTC control units to which the selected channel paths are already connected. Either accept the proposal via the **Accept** button, or reject it with the **Reject** button. In case you have accepted the proposal, the **Edit CTC Connection** dialog appears, prefilled with the accepted proposed control unit and device information. Check the information in this dialog, and if the CTC connection is already as it should be, press the **Close** button. The CTC connection is now defined, and HCM also recognized this CTC connection. In case you have rejected the proposed information, you should be able to select the correct control units and devices via pressing the **Add Existing ...** button on the **Edit CTC Connection** dialog. Select the correct CTC control units and the connected CTC devices in the **Select CTC Control Unit** dialog, press the **OK** button, and return to the **Edit CTC Connection** dialog. After having selected all CTC correct control units and devices, the CTC connection is complete. Note that under the above assumption, HCM either proposes the correct CTC control units, or you find the CTC control units and devices in the **Select CTC Control Unit** dialog.

## Connecting CHPIDs via Coupling Facility Connections

A *coupling facility* is a special logical partition that provides high-speed caching, list processing, and locking functions in a processor. It involves connecting a partition on one processor to a partition on another processor.

The following diagram represents two CF-connections involving CHPIDs 70 and 10 respectively 71 and 11. Note, that the CF control units and devices are not explicitly shown.

You can determine if a selected partition will be used solely for standard operating system connections (OS), as a coupling facility (CF) or both (CF/OS) by selecting a *Usage* option in the **Create Partition** dialog from the **Create** menu.

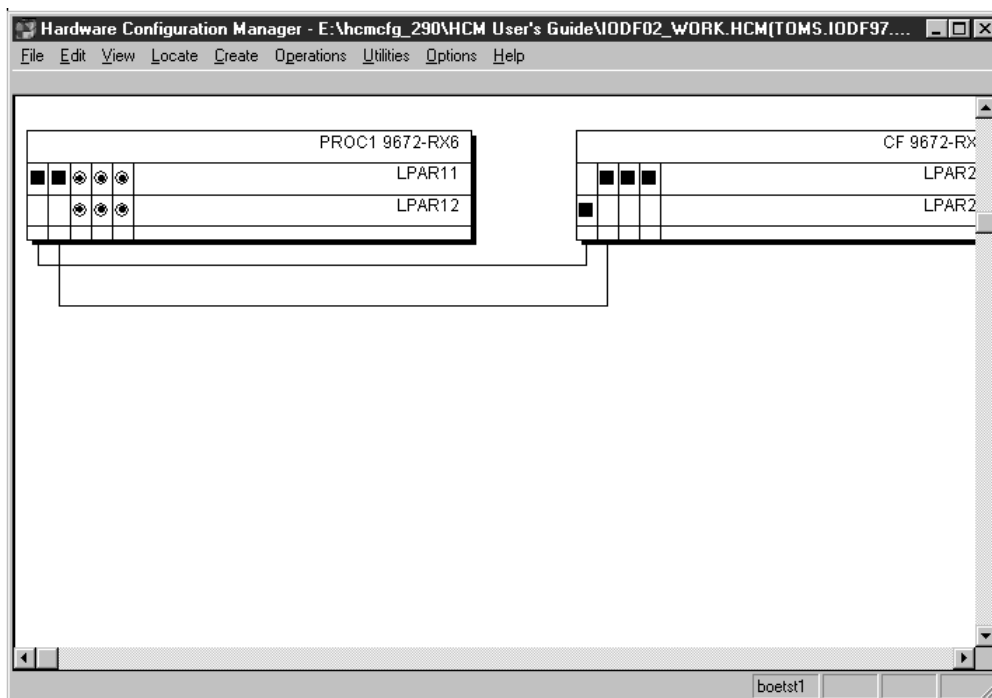


Figure 100. Coupling Facility Connection

You can only create a coupling facility connection between a sending CF CHPID on one processor or partition and a receiving CF CHPID on another. You can view all coupling facility connections in the dialog of the same name. Open the **Coupling Facility Connections** dialog with the **CF Connections...** option in the **Edit** menu, and use the View section options to sort the list box contents by CF sender or receiver CHPID.

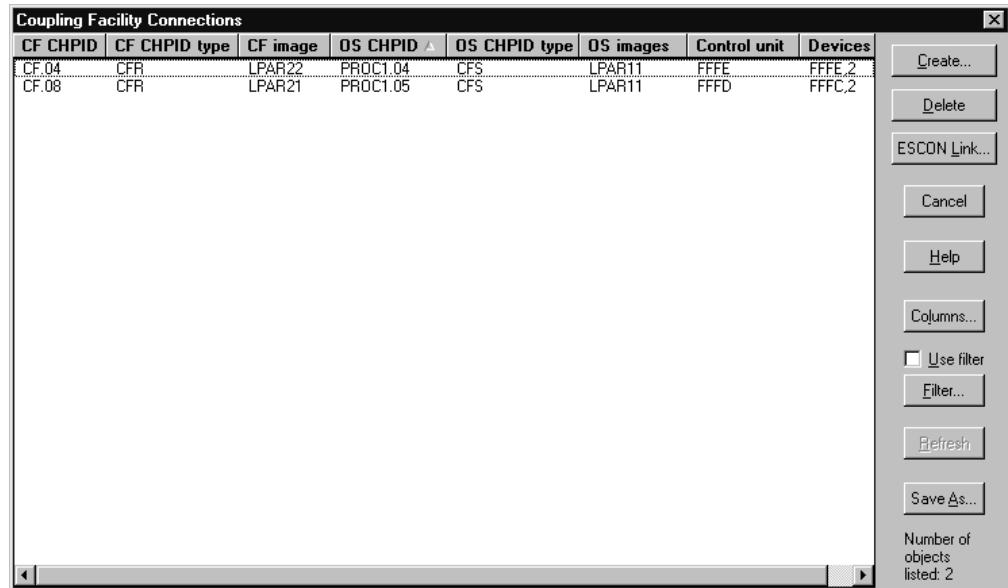


Figure 101. Coupling Facility Connections Dialog

## Creating a Coupling Facility Connection

Choose **CF Connection...** from the **Create** menu or press the **Create...** button in the **Coupling Facility Connections** dialog to open the **Create Coupling Facility Connection** dialog, which allows you to specify the sending and receiving channels for the connection.

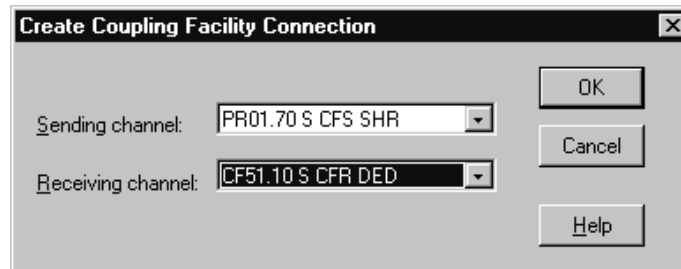


Figure 102. Create Coupling Facility Connection Dialog

Pressing **OK** will automatically open the **Choose CU and Device Numbers** dialog, where you can set the control unit number and device number for the connection. If there already is a CF connection between the two partitions, then the same control unit is used and the control unit number cannot be edited. Each CF connection requires devices of its own.

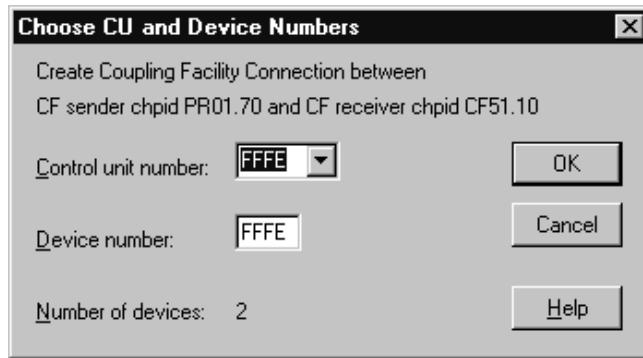


Figure 103. Choose CU and Device Numbers Dialog

## Deleting a Coupling Facility Connection

Select the coupling facility connection from the list box in the **Coupling Facility Connections** dialog and press the **Delete** button. HCM will display a confirmation dialog before “deleting” the connection; that is, HCM disconnects the two CHPIDs and deletes the corresponding control units and devices.

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## Chapter 8. Physical Connections

This chapter explains how to add strictly physical elements to the connections of your configuration; specifically: cables, patchports, and crossbar switches.

In HCM, connections are made initially without concern for physical cables and patchports (see Chapter 7, “Connecting Objects in Your Configuration” on page 127). Cables and patchports are assigned to connections after the connections have been made. These physical aspects of the connection are not reflected in the IODF and are not required in order to build a correct production IODF.

---

### Managing Physical Cables

New connections initially have no physical cables assigned. You can either assign a cable immediately after creating the connection, or assign cables after a series of connections.

HCM displays cable IDs and length information in the Object Information Bar (at the top of the screen) when the mouse cursor is placed over an interface with an assigned physical cable. This information will appear in reports and on printed configuration diagrams.

HCM interprets trunk cable IDs as two fields separated by a slash, ‘/’. The first field identifies the trunk; the second indicates the pair of conductors (channel) within the trunk. For example, trunk cable ID TR1234/07 is Channel 07 in Trunk TR1234.

Cables can have three states: *in use*, *unused* or *in inventory*.

- **In Use:** Cables that are currently assigned to connections. Cables are assigned to connections using the **Assign Cable** dialog.
- **Unused:** Cables that were once assigned to connections. A cable becomes unused when its connection is broken or when a new cable is assigned to the connection. Unused cables retain information about where they were last used, to make it easy to identify them when you re-connect them. Note that re-connecting an interface or re-positioning it on a daisy-chain will disconnect the physical cable on the interface.
- **In Inventory:** Cables that are not currently assigned to a connection and for which there is no record of any previous connection they might have been assigned to. They can be assigned to connections.

Cables come to be in inventory in two ways.

- Unused cables can be moved to inventory using the **Cable Assignments** dialog. The only difference between unused cables and cables in inventory is that unused cables retain information about their last connection. You would move unused cables into inventory when you know that they will not be re-used in the near future.
- The inventory can be populated by importing cable descriptions from an ASCII file. See Chapter 15, “Importing and Exporting Data” on page 283 for more information.

An unused cable retains its last connection information until it is again assigned to a connection, or it is deleted, or it is placed into inventory. A cable in inventory, remains there until it is assigned to a connection or it is deleted.

## Assigning Cables to Connections

There are several ways to edit the cable assignments for connections in your configuration.

The most efficient way to edit the cable assignments for several connections at once is to select **Cable Assignments...** from the **Edit** menu. This opens the **Cable Assignments** dialog which lists the connections and their cable assignments.

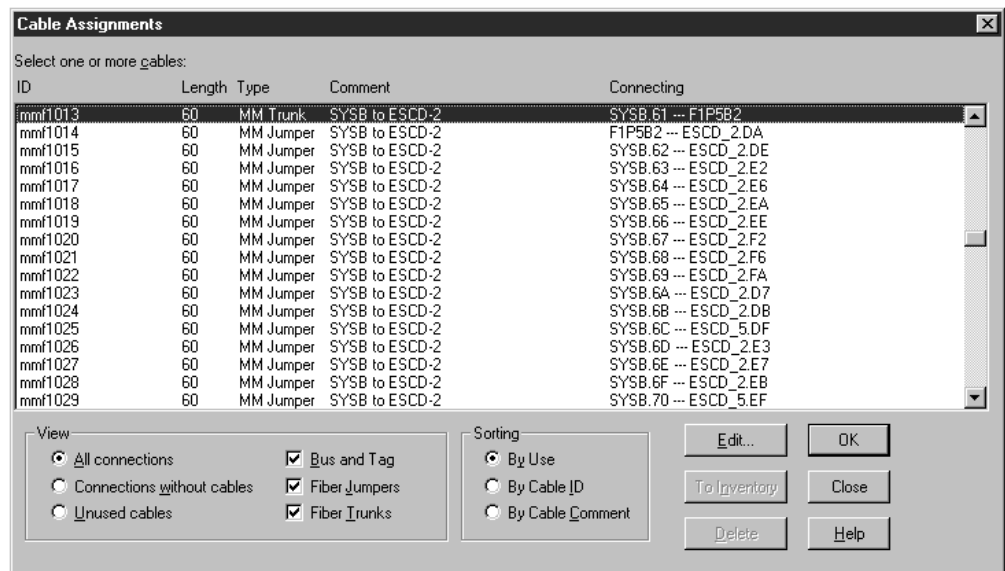


Figure 104. Cable Assignments Dialog

## Viewing Cables and Connections

In the **Cable Assignments** dialog, use the **View** options to determine which cables and/or connections appear in the list box. You can display all connections, regardless of whether physical cables are assigned to them. Connections are ordered by CHPID. You can display connections without cables, or all unused cables and cables in inventory.

The **Bus and Tag**, **Fiber Jumpers** and **Fiber Trunks** options control which types of cables are displayed in the list box. The contents of the list box are unaffected by these options if the "Connections without cables" option is selected.

You can also specify the order in which cables and connections are listed with the **Sorting** options.

- Choose "By Use" to sort the connections by the names of the connected interfaces. Cables that form a daisy-chain are grouped together with the second and subsequent cables in the chain indented.
- Choose "By Cable ID" to sort connections by cable ID. Connections without cables appear first in no particular order, followed by connections with cables in alphanumeric order.

### Creating or Editing Cables

Select either “All connections” or “Connections without cables” in the View section of the **Cable Assignments** dialog, then select the connection(s) and press the **Edit...** button. The **Assign Cable** dialog is opened allowing you to create or edit the cable assigned to the connection.

### Transferring Unused Cables to Inventory

Select “Unused cables” in the View section of the **Cable Assignments** dialog, then select the cable(s) to be moved to inventory. Press the **To Inventory** button. Note that cables in inventory, as well as unused cables, appear as possible choices when editing cable assignments in the **Assign Cable** dialog.

### Deleting Cables

Select the “Unused cables” option in the View section of the **Cable Assignments** dialog, then select the cable(s) and press the **Delete** button. HCM displays a confirmation dialog before deleting the selected unused or inventory cables. HCM does not retain any information on these cables, once they are deleted.

### Other Ways to Assign Cables

Besides using the **Cable Assignments** dialog, you can use any of the following methods of accessing the **Assign Cable** dialog.

- To edit a single cable assignment from the diagram, select the lower interface of the connection, and select **Edit cable on selected interface...** from the **Edit** menu (Shortcut: press F5).
- To edit several cable assignments from the diagram, choose **Interface Selection...** from the **Options** menu and check “Edit the physical cable assignment for the interface”. Now double-click on the lower interface of each connection to open the **Assign Cable** dialog.
- You can edit the cable assignments for connections within a fiber link from the **Edit Fiber Link** dialog by selecting a cable or dashes (unlabeled cable) and clicking on the **Edit Cable...** button. See “Editing Fiber Links” on page 160 for more details.

## Creating and Editing Cables

Use any of the methods described under “Assigning Cables to Connections” on page 156 to open the **Assign Cable** dialog for a particular connection.

**Assign Cable**

Connection: ESCD\_2.8F --- 3990 #2.SC1.A ☐ Connection is Permanent

ID: mmf1063 Type: Multi Mode Jumper db Loss A: N/A

Length: 50 db Loss B: N/A

Comment: User defined Comment

Unused cables:

ID	Type	Length	Last use	Time of last use	Comment
mmf1110	MMJ	60	SYSB.61 --- ESCD_2.10	2000-12-14 13:57:25	

Figure 105. Assign Cable Dialog

## Creating a New Cable to Assign to a Connection

In the **Assign Cable** dialog, you can create a new cable for a connection by entering a new Cable ID, cable type, and (optionally) the cable's length and db loss, then pressing **OK**. The ID must be unique.

HCM currently supports the following cable types:

### Parallel

- Gray Fully Populated
- Gray Partially Populated
- Blue Fully Populated
- Blue Partially Populated
- Bi-directional

### Serial

- Single Mode Jumper
- Multi Mode Jumper
- Single Mode Trunk
- Multi Mode Trunk

## Reusing an Existing Cable for a Connection

The Unused Cables listbox contains both unused cables and cables in inventory. The unused cables are listed first. To reuse an existing cable for a connection, select it by clicking on it in the Unused Cables list box in the **Assign Cable** dialog. (Alternatively, type its cable ID in the appropriate text box, and press **OK**.)

Pressing the **Cable ID's...** button displays a list of all cable IDs already in use by connections.

When you change the cable assignment for a connection, the old cable is placed in the unused cables pool.

## Removing a Cable from a Connection

To remove the current cable assignment from the connection, select “No physical cable assignment” in the listbox and press **OK**. The cable goes into inventory and the connection is left with no cable assignment.

## Printing Cable Labels

You can print labels for cables that are in use in your configuration. Cable labels can then be attached to the physical cables for easy identification. Open the **Select Cable Labels to Print** dialog by choosing **Print Cable Labels...** from the **File** menu.

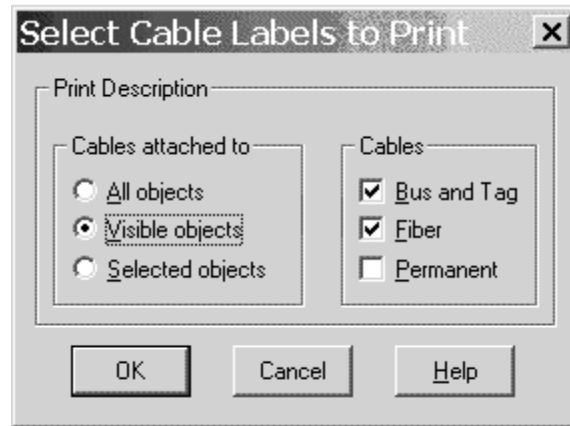


Figure 106. Select Cable Labels to Print Dialog

Select the type of cables (bus and tag; fiber; permanent connections to patchports) for which you wish to print labels. You can restrict the number of labels by printing only those attached to visible objects (those currently included in the diagram), or only those that are currently selected.

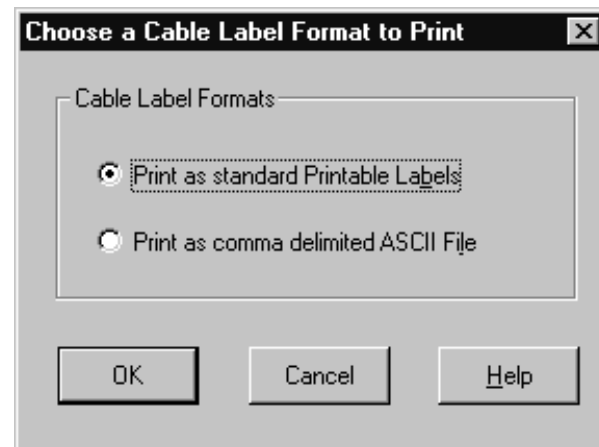


Figure 107. Choose a Cable Label Format to Print Dialog

Pressing **OK** opens the **Choose a Cable Label Format to Print** dialog. You can print labels directly to the printer with the standard format, or to an ASCII file where you can customize the formatting.

- **Standard printable labels** prints the labels to the current printer, which is presumably loaded with appropriate label forms. These self laminating labels must comply to the following specifications:

Color	Clear
Write-on area (width x length)	1.00 x 0.47
Total label (width x length)	1.00 x 1.33
Number of columns	7
Number of rows	7
Labels per sheet	49

- **Comma delimited ASCII file** prompts you for the filename to write the information to. There are programs available that can read, format and print the cable label information.

See "Sample Cable Labels" on page 228 for examples of standard printable labels and comma delimited ASCII file labels.

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## Editing Fiber Links

As described in Chapter 7, "Connecting Objects in Your Configuration" on page 127, a logical connection may be "realized" by more than one physical cable, often passing through a number of patchports. For serial connections, HCM uses the term "fiber link" to describe the complete connection between two interfaces (optical transceivers). HCM allows you to insert patchports into an fiber link, to assign cables to each segment of the link, and to mark certain connections as "permanent" so they will not disappear when connections between active ESCON or FICON objects are broken. There are two methods for setting up fiber links. For "infrastructure" connections (i.e., trunk cables), you should use the **Cabinet** dialog. To document the jumper cables and patchports that are used in a connection between active ESCON or FICON objects, you should use the **Edit Fiber Link** dialog. In general, you should use the following sequence:

1. Create any cabinets and patchports and make necessary permanent connections between them. This is normally done when new cabinets are installed and connected with trunk cables.
2. Make permanent connections from patch panels to CHPIDs and switch ports.
3. Make all logical connections (between CHPIDs, switch ports, and channel interfaces). This step can be performed separately and without regard for fiber links.
4. Add patchports and cables to the fiber link (that is, make mutable connections by editing the fiber link).

This section covers steps 1 and 2 (Infrastructure Connections) and 4 (Jumper Connections), plus information on disconnecting fiber links. For more information on step 3, see Chapter 7, "Connecting Objects in Your Configuration" on page 127.

## Infrastructure Connections

HCM has the concept of a "permanent" connection to model infrastructure connections that are set up as a permanent fixture of the data center. Any serial connection that does not involve a converter may be marked as "permanent" in HCM, but normally this attribute is used for trunk connections that

- link the backs of two patch panels,
- link a group of CHPIDs to the back of a patch panel, or
- link a group of switch ports to the back of a patch panel

When a patchport is connected to a CHPID or switch port in this manner, the patchport (and any other patchports connected to it) are automatically added to the fiber link when the CHPID or switch port is logically connected. Furthermore, these connections will remain in place when logical connections are broken. Such connections should be made from the **Cabinet** dialog. As an example, to connect the back of one panel to the back of another, start by double-clicking the cabinet in the configuration diagram (or choose **Cabinet...** from the **Edit** menu and double-click the appropriate cabinet to open the **Cabinet** dialog shown in the following figure:

Make sure the **Back** radio button in the **View** group box is selected. This tells

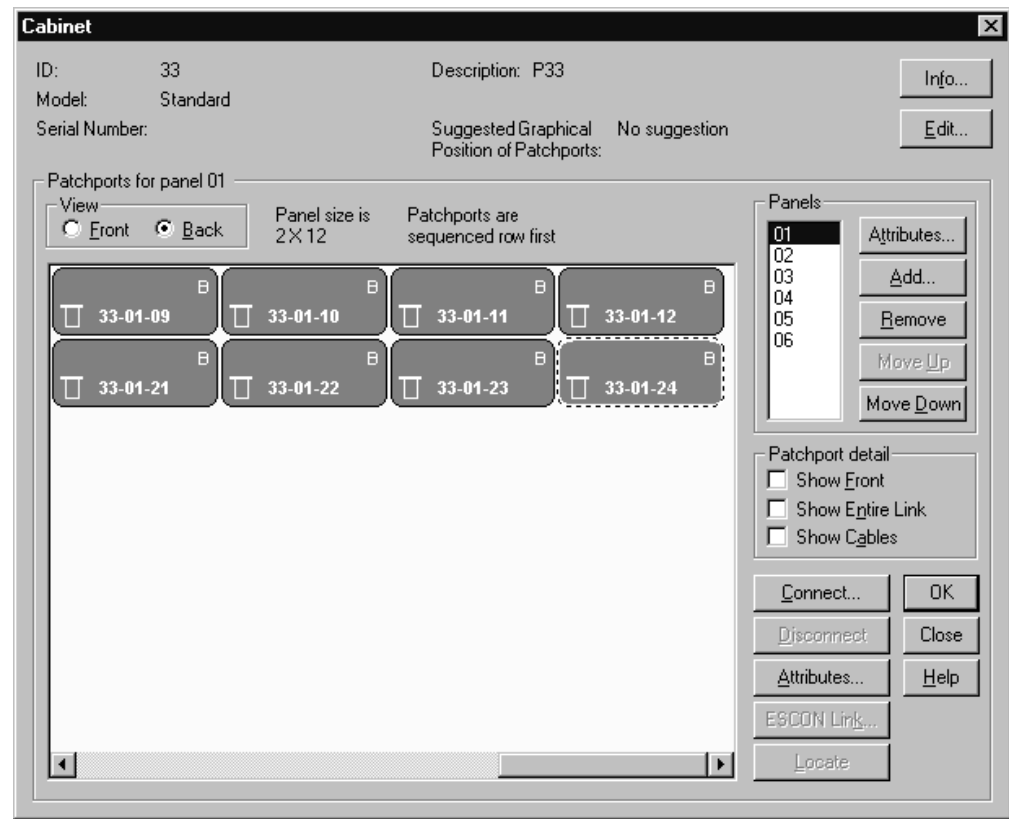


Figure 108. Cabinet Dialog

HCM that subsequent connect operations are made to the back of patchports. Select the appropriate panel from the **Panels** list, and then select all of the patchports in the panel by clicking (and holding) the left mouse button on the first patchport and moving the pointer to the last patchport before releasing. Now click **Connect...**; you will be presented with the **Select Connection Target(s)** dialog.

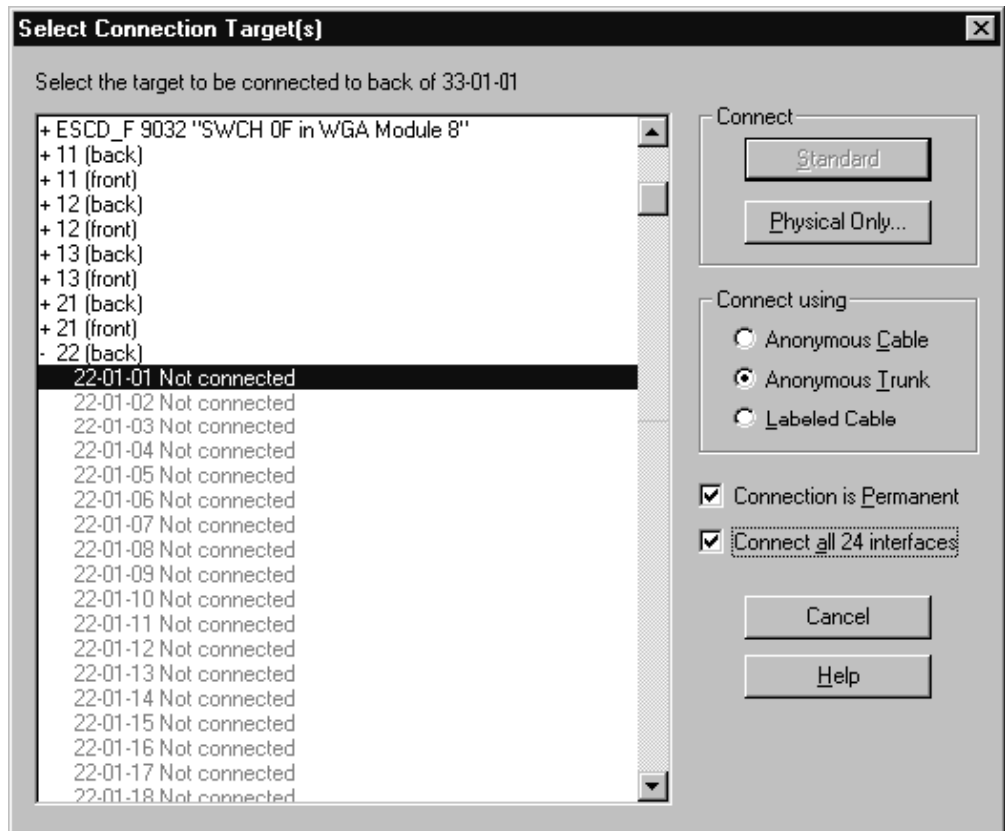


Figure 109. Select Connection Target(s) Dialog

In this dialog, check both the **Connection is Permanent** box and the **Connect all X interfaces** box. Double-click the "(back)" entry of the target cabinet, and then double-click the first patchport in the target panel. The **Cabinet** dialog reappears with the patchport diagram updated to include the permanent connections. If you want to label the cables involved in these connections, you can do so by choosing the **Labeled Cable** option. In this case, the **Assign Cable** dialog will appear as many times as necessary to allow you to label the cable for each connection. Connecting the back of a patch panel to a range of CHPIDs or switch ports is similar. In these cases, you pick the appropriate starting CHPID or port from the **Select Connection Target(s)** dialog. If any of the target interfaces are used in complete fiber links, then the patchport will be inserted into the fiber link (you will be asked to confirm the connection in such cases). This allows trunk connections to CHPIDs and switch ports to be added after an IODF load without disturbing connections in the IODF.

## Disconnecting Permanent Connections from Patchports

To disconnect one or more permanent connections on patchports: Double-click on a cabinet in the configuration diagram (or choose **Cabinet...** from the **Edit** menu and double-click the appropriate cabinet) to open the **Cabinet** dialog. Select the correct side of the panel (back or front), select the range of patchports to be disconnected, and click the **Disconnect** button on the **Cabinet** dialog panel. Since the connections are marked as permanent, you will be asked to confirm that you want to disconnect. If any of the patchports are involved in complete fiber links, they will be removed from the fiber link when the permanent connection is broken.

## Jumper Connections

Jumper connections are usually made using the *Edit Fiber Link* dialog after logical connections have been set up. As an example, when you are configuring a new controller, typically you will create the controller and connect it to CHPIDs and/or switch ports as described in previous chapters. Once this is done, you can document the physical cables and patchports that are used to realize the logical connections by selecting the "bottom" end of each connection (e.g. the controller interface connected to a switch port, or a switch port connected to a CHPID) and clicking "Fiber Link..."

## Editing Fiber Links in the Dialog

Open the **Edit Fiber Link** dialog by pressing the **Fiber Link...** button in the edit dialog for the active ESCON or FICON object "below" the fiber link (this includes Edit Converter, Controller, Director, and Edit CTC Connection dialogs). See panel in Figure 110 on page 164. Note that if the **Fiber Link...** button is disabled, there is no fiber link for the selected interface; you must make a connection before you can edit the fiber link.

Alternatively, in the Cabinet dialog panel, select the patchport whose fiber link is to be edited. Open the **Edit Fiber Link** dialog by pressing the **Fiber Link...** button in the **Cabinet** dialog. Note that if the **Fiber Link...** button is disabled, there is no fiber link for the selected interface; you must make a connection before you can edit the fiber link.

The Current Fiber Link composition list box shown in Figure 110 on page 164 displays all objects in the fiber link, including cables which are indented, and undefined cables which are represented by dashes (- - -). The Available Patchports list box on the left displays all cabinets and their patchports. This box is empty unless dashes are selected in the Current Fiber link composition list box. Double-click on a cabinet with a plus (+) sign to expand it to display its available patchports; double-click a cabinet with a minus (-) sign to contract it. Invalid patchports are disabled.

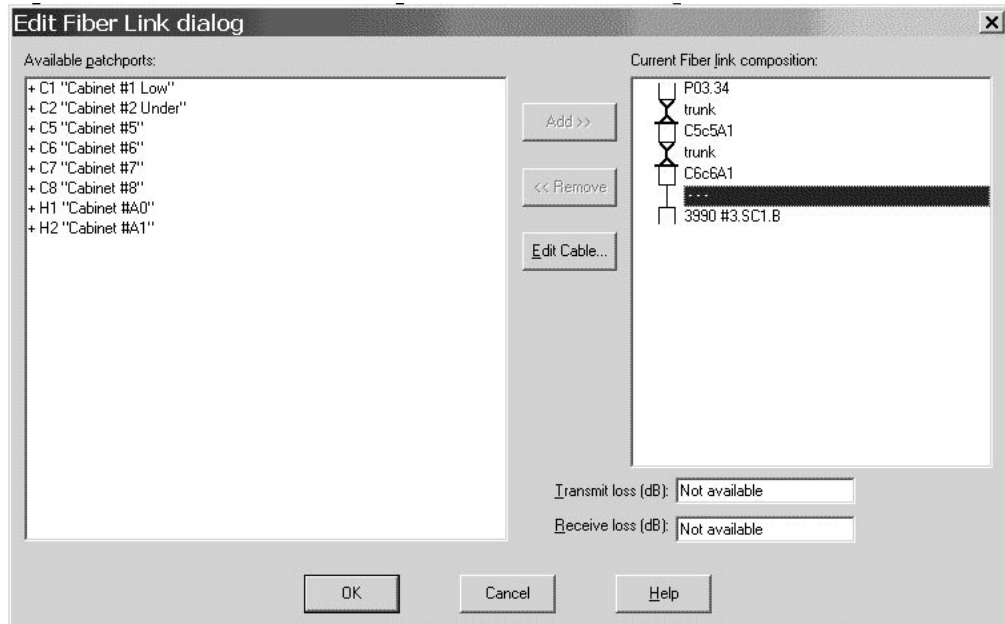


Figure 110. Edit Fiber Link Dialog

## Adding a Patchport to the Fiber Link

To add a patchport to the fiber link, select the dashes (- -) at the position where you wish to add the patchport. All available cabinets and patchports will appear in the list box on the left; any permanently connected patchports are shown on the same line with a cable ID if there is one. Select an available patchport and click on the **Add** button. Alternatively, double-click on the patchport. If the patchport is permanently connected to others, all will be added to the fiber link. The selected patchport will be connected to the object listed below the selected dashes.

## Removing a Patchport from the Fiber Link

To remove a patchport from the fiber link, select the patchport in the composition list box and click on the **Remove** button. Alternatively, double-click on the patchport. If the patchport is permanently connected to other patchports, all are removed from the fiber link at once. Note that you cannot remove a patchport that is permanently connected to a CHPID in this dialog.

**Note:** You cannot remove a patchport that is permanently connected to a CHPID, switch port, or controller interface in this dialog. If you indeed intend to break such a connection, first clear the "Connection is Permanent" flag using the "Assign Cable" dialog.

## Assigning Cables Between the Objects in a Fiber Link

To assign cables between the objects in a fiber link, select the dashes (- -) at the position where you wish to add the cable and press the **Edit Cable...** button. This opens the **Assign Cable** dialog. See "Managing Physical Cables" on page 155 for more information.

You can also edit dB loss for the fiber link. Specify the transmit and receive attenuation (dB loss) for the fiber link; these fields are stored and can be compared with subsequent dB loss measurements.

## Disconnecting a Fiber Link

When a switch port or a serial interface on a controller is disconnected (either explicitly or implicitly via reconnect), HCM will prompt the user to choose which mutable link is to be broken if there is more than one. Consider the example from Figure 111 showing four CHPIDs connected to two switches. From the diagram, it is evident that both the CHPIDs and the switch ports are trunked to the backs of cabinets, and that the link from each CHPID to its connected port also passes through another trunk connection linking the backs of two other cabinets:

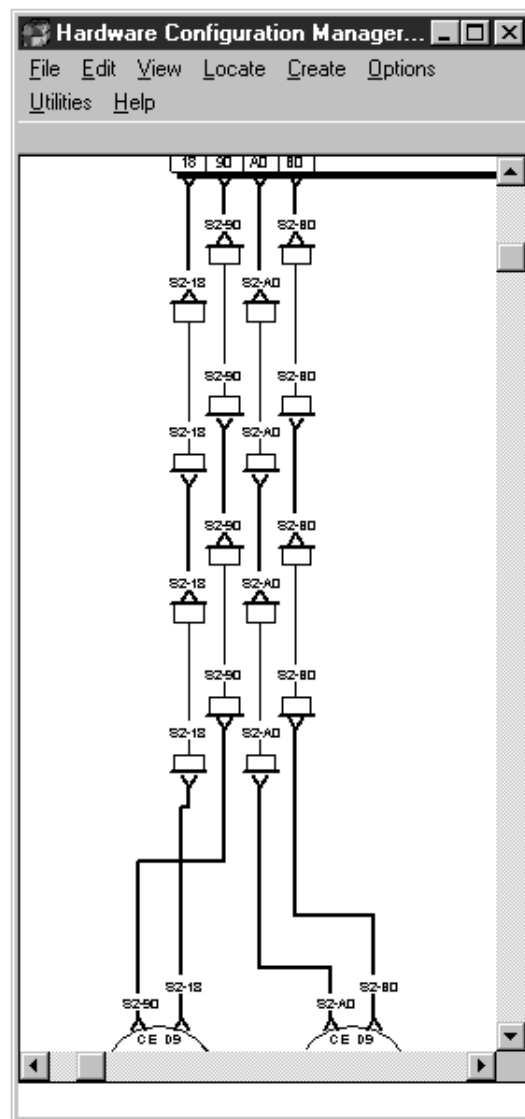


Figure 111. Configuration Diagram

In such a configuration, all of the trunk connections would be marked as permanent to indicate that they will not change. If you wanted to disconnect one of the ports, say D9 (perhaps so it could be connected later to another CHPID), HCM would detect that there are two cable positions at which the connection could be broken (that is, the two jumper connections linking the fronts of cabinets) and ask you to choose one of those two positions as follows:

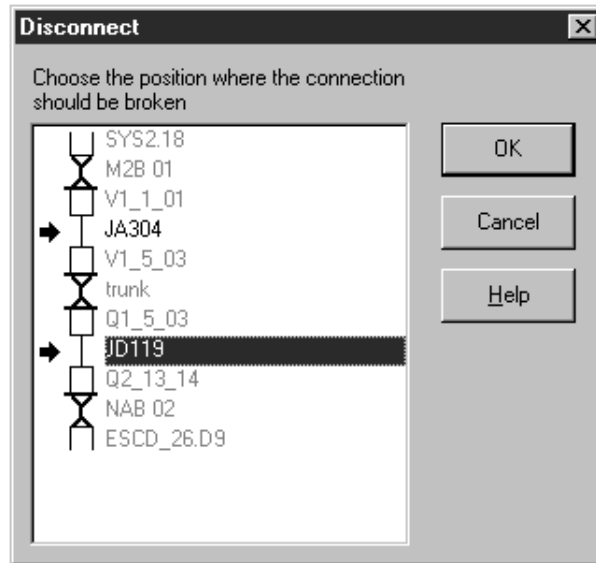


Figure 112. Disconnect Dialog

This dialog indicates the mutable connections by an arrow and preselects the lowest mutable connection. Clicking OK or double-clicking a mutable link will break the connection.

If you choose to break the connection in the lower position (using cable JD119), the other jumper cable (JA304, in this case) will remain in place even though it is not a permanent connection. This means that if you later connect, say, a switch port to CHPID SYS2.18, patchport Q1\_5\_03 and jumper JA304 will automatically be included in the fiber link of the new connection.

This dialog will not appear if there is only one mutable connection (e.g., there is only one jumper connecting the CHPID and port); in such cases, the connection will be broken at the one mutable link. Also, if the connection involves a P->S or S->P converter, HCM will automatically disconnect in such a way as to remove the converter and leave all the other connections intact. Finally, if all the links in the chain are marked as permanent, HCM will refuse to break the connection.

---

## Connecting Crossbar Switches

Crossbar switches can be inserted into the connection between controllers and processors. The crossbar *channel interface* can connect upwards to either a processor CHPID or another crossbar's *control unit interface*. A crossbar may also connect upwards to a switch (through a converter), but not vice versa. That is, a crossbar channel interface can connect to a switch port, but a switch port may not connect to a crossbar control unit interface. Crossbar interfaces are parallel (bus and tag), unlike switch interfaces, which are serial (ESCON or FICON). Thus crossbars are never part of fiber links.

To insert a crossbar switch into an existing connection, you must first disconnect the controller from the processor. Then connect the crossbar to the processor. Finally, connect the controller upwards to the crossbar (see "Connecting Controllers to Processors" on page 135 for more information).

## Connecting a Crossbar Switch

To connect a crossbar switch, open the **Crossbar Switch** dialog by double-clicking on a crossbar or choosing **Crossbar Switch...** from the **Edit** menu. Select a crossbar channel interface and press the **Connect...** button. The **Connect Channel Interface** dialog (similar to the one used to connect controller channel interfaces) opens to allow you to select a target interface.

Select a processor CHPID, another crossbar or a switch in the list box. You can double-click on a target object with a plus (+) sign to expand it to display its interfaces; double-click on a target with a minus (-) sign to contract it. After you have selected the target, press the **OK** button. Alternatively, double-click on the target interface.

## Positioning a Crossbar Switch on a Daisy-Chain

If you are connecting the crossbar channel interface to a CHPID which is already connected to another crossbar switch, the **Position Interface** dialog appears for you to position the crossbar in the connection. Select a crossbar in the Channel Interfaces list box and drag it to the desired position in the list. See “Positioning Objects Along Daisy-Chained Connections” on page 128 for more details.

## Disconnecting a Crossbar Channel Interface

Open the **Edit Crossbar Switch** dialog by double-clicking on a crossbar in the configuration diagram. Select the connected crossbar channel interface from the Channel Interfaces list box and press the **Disconnect** button. HCM will ask you to confirm the disconnection before doing it.



---

## Chapter 9. Utilities

HCM offers several utilities to assist in Fibre Channel migration and other time-consuming tasks. These utilities support you in making complex configuration changes without violating any logical definitions that are valid in your configuration.

You invoke the available utilities from the **Utilities** menu. They are wizards that guide you through the various functions. After changing your configuration, you will be shown a summary of your changes and asked whether you wish to accept or discard them. The summary can also be saved to a file.

---

### Moving Port Connections

This utility allows moving port connections. In particular, you can move complete CHPID-to-control-unit connections that have a path through an ESCON or FICON switch from one switch to another, or rearranging those connections on a single switch. Using this utility, you no longer have to manually disconnect and connect the involved objects.

When moving port connections using the utility, the following data will be automatically updated:

- Link address of affected control units
- Dynamic switch parameter of the affected CHPIDs
- Port configurations of source and target port when moving within the same switch

You can only move ports that are connected to another object.

When you move a port connection to another switch, note that all other connections that are *implied* by this move are also moved. That is, in addition to the selected CHPID-to-control-unit connection, HCM also moves all connections that are required to keep the logical definitions between CHPIDs and control units valid. For example, moving a CHPID from switch A to switch B implies a move of the control unit connections that are serviced by that CHPID and, furthermore, all CHPIDs that have access to those control units via switch A. See “Implied Ports” on page 170 for an example of implied ports.

Since a move of one port connection may imply a move of several other port connections, be aware that there might not be enough empty ports available on the target switch.

You cannot move port FE if this port is the switch control unit port of the switch of interest. Therefore, if port FE is implied in a port move, the move cannot be performed. You first have to disconnect port FE by disconnecting the internal control unit from the related CHPIDs.

If you move a port connection on the same switch, all port matrices are updated accordingly. If you move a port to another switch neither the target port matrices nor the source port matrices are updated. You have to manually update your source and target configurations.

If a port or connection, which is involved in the move, has a logical or physical inconsistency, the move will not be allowed. For example, a control unit has a link address to a port but physically the control unit is not available. If this is the case, a move that involves this port is not allowed. See “Receiving Visual Warnings” on page 43 for more information on physical inconsistencies.

## Implied Ports

The following example explains that moving a port connection might imply that other port connections also need to be moved. Assume, you want to move CHPID 21 that connects to port C1 to another switch in the following example.

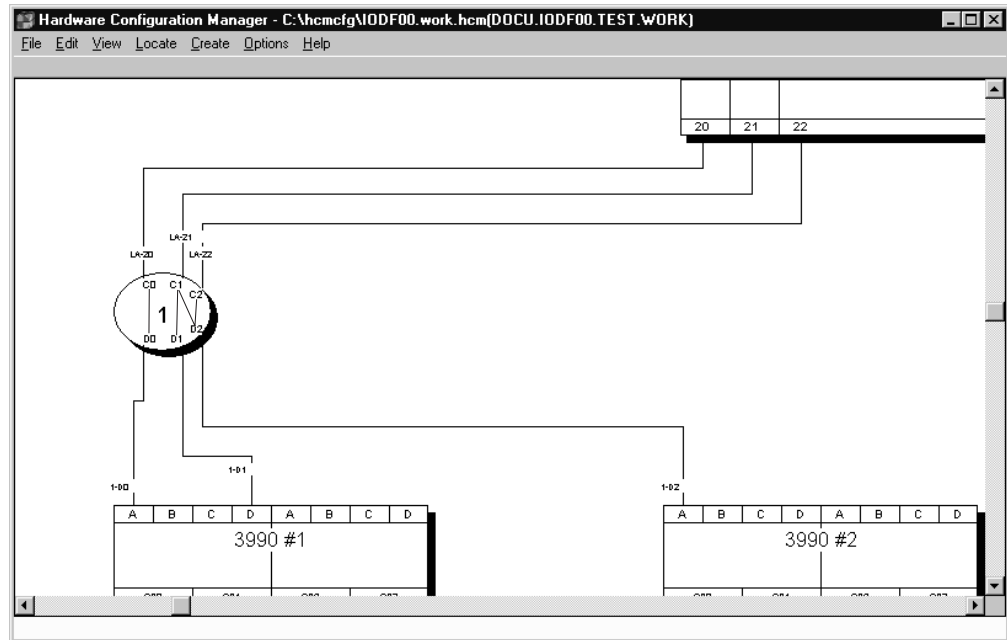


Figure 113. Example for Implied Ports

Assume a CHPID 21 connected to a port C1 has a path to two control units that are connected to port D1 and D2. Furthermore, the control unit of port D2 is also serviced by a CHPID 22 connected to port C2. When you want to move port C1 with its connections, the utility will also automatically move ports D1, D2, and C2 to the target switch.

## Procedure

The utility guides you through the following steps:

1. Select **Move Port Connections...** from the **Utilities** menu.
2. Select a switch as target.
3. Choose one or more ports whose connections you want to move to the target switch. The ports may be from any switch, including the target switch.
4. Choose ports on the target switch for all ports to be moved.
5. Before you finish the moving of port connections, a list shows you all changes that will be made. Save this list and finish the move.

---

## Aggregating CHPIDs

This utility allows you to combine attachments of several CHPIDs onto a single CHPID. That is, all control units connected to the source CHPIDs will be disconnected from the source CHPIDs and connected to a target CHPID.

All the CHPIDs should be connected to the same switch and use the same dynamic switch.

When you aggregate CHPIDs, HCM does not change the reachability of devices by logical partitions (LPs). The LPs in the access or candidate list of the source CHPID must be a subset or equal the LPs in the access or candidate list of the target CHPID. If the target CHPID is shared and the LPs in the access or candidate list of the CHPIDs to be aggregated are a subset of the LPs in the access or candidate list of the target CHPID, then an explicit device candidate list will be built. When the device already had an explicit device candidate list, it will be left unchanged.

If a CHPID was involved in a CTC connection, all CTC control units connected to the CHPID entry port are moved to the CHPID entry port of the target switch. The CU link addresses are updated accordingly to create valid CTC connections.

### Procedure

The utility guides you through the following steps:

1. Select **Aggregate CHPIDs...** from the **Utilities** menu.
2. Choose a CHPID as the target.
3. Choose one or more CHPIDs to aggregate with the target CHPID.
4. Before you finish the aggregation of CHPIDs, a list shows you all changes that will be made. Save this list and finish the aggregation.

---

## Converting CNC Channels to FICON Channels

This utility supports you in making the necessary I/O configuration changes when you install a new FICON bridge card on an ESCON switch. Before you can start a conversion, the following prerequisites must be met:

- You can only convert a CHPID that is already connected to a port and defined as type CNC or FCV. If the CHPID is CNC, it must be eligible to be an FCV channel. HCM automatically performs a CHPID type change.
- The ESCON port that connects to the CHPID must be FCV eligible.

HCM checks whether the correct number of unconnected port addresses follow the ESCON port that connects to the new channel. If the installation of the new card causes a conflict with already connected ports, HCM initiates moving of the affected ports or aggregating CHPID-to-control-unit definitions. Refer to the description of the wizards Moving Port Connections on page 169 and Aggregating CHPIDs on page 171 for considerations on those subjects.

The utility guides you through the following steps:

1. Select **Convert ESCON Port to FC Port...** from the **Utilities** menu.
2. Choose an ESCON port that is FCV eligible and already connected to a CNC or FCV channel.
3. A dialog appears that lets you aggregate source CHPIDs to a target CHPID. Refer to Aggregating CHPIDs on page 171 for an example on things to consider when aggregating CHPIDs.

4. If some of the switch ports displaced by the fiber channel port were previously connected, you are prompted to move the required port. Refer to Moving Port Connections on page 169 for an example on things to consider when moving ports.
5. Before you finish the conversion, a list shows you all changes that will be made. Save this list and finish the conversion.

See “Scenario IV – Configuration Changes for Installing a FICON Bridge Card in a 9032–5 ESCON Director” on page 268 for an example of the use of this utility.

---

## Priming the IODF with Sensed Data

This utility allows you to save sensed data such as serial numbers and volume serial numbers (VOLSER) into the IODF. Before you can start working with this wizard, data must first be sensed. To do this, use the ‘Sense’ command from the Operations menu to populate the configuration with sensed data. A prerequisite for this wizard is availability of the I/O Operations functions; otherwise, sensing of data is not possible.

The utility guides you through the following steps:

1. Choose the set of IODF serial numbers (on processors, switches, control units and devices) that will be updated with the sensed serial number value.
2. Choose the set of IODF VOLSERS that will be updated with the sensed VOLSER value.
3. Examine a summary of the sensed data that is to be updated. Before you finish the utility, you can save the list of changes. Click ‘Finish’ to perform the operation you selected in the previous steps.

Data which has been sensed can be deleted later by selecting **Clear Previous Sensing Data** in the **Sense** submenu of the **Operations** menu.

---

## Changing the CHPID Link Address Format

This utility allows you to modify the link address format for FC channel paths. Starting with a specific processor support level for the 2064 processor family, the channel paths support the definition of two-byte link addresses. Using this utility, you can explicitly upgrade one-byte link addresses for a selected FC channel path to two-byte link addresses. Similarly, you can also downgrade two-byte link addresses for a selected FC channel path to one-byte link addresses. Remember that no link address format mix is allowed for FC channel paths, that means all connections are defined either via one-byte link addresses or two-byte link addresses.

The utility guides you through the following steps:

1. Choose whether to convert one-byte link addresses into two-byte link addresses or vice versa.
2. Select the CHPID(s) for which the link address format has to be converted.
3. Examine the summary of modified link addresses.

Before you finish the utility, you can save the list of changes. Click **Finish** to perform the operation you selected in the previous steps.

---

## Chapter 10. Operating System Configurations

Each device can be defined to one or more operating systems. The hardware configuration contains this definition information, known as the *operating system (OS) configuration*. Note that you may define devices and their associated parameters to an OS configuration, even if they are not explicitly connected.

Typically, the OS configuration is associated with a processor or partition. Each processor can run different OS configurations at different times. There are two types of OS configuration: MVS and VM.

An MVS OS configuration can contain one or more EDTs. An *Eligible Device Table or EDT* is a list of esoteric device groups, plus the names of the generic device types which determine how devices are used (order of preference) within each esoteric. The EDT is identified by a two-digit ID; you must define at least one EDT for each MVS OS configuration.

An *esoteric device group* or *esoteric* is an installation-defined and named grouping of I/O devices under an EDT. An esoteric acts as a single “virtual device” which can be allocated without using a specific device number. Devices within an esoteric are usually from the same device group, but can be of different device types.

Every device type is associated with a *generic device group* or *generic*. A generic is an MVS-defined grouping of devices with similar characteristics, which determines how devices are used in an esoteric device group. Each generic has a *preference number* which governs the order of allocation of devices to jobs within an esoteric. For example, if the esoteric contains the device types 3390, 3380 and 3350, and the generics associated with the device types have preference numbers 280, 290 and 300, respectively, then the preference numbers are used by the MVS allocation component to assign the devices in that order of preference.

Faster devices have lower preference numbers. You can change the preference number of a generic under an EDT (*user-defined generic*), but not under an OS configuration (*system-defined generic*).

You can mark one or more of the devices defined to an OS configuration to be your consoles. A *console* displays system-related information (for example, error messages) directly from MVS. For the MVS system, you can specify NIP consoles; in VM/ESA, you can specify primary and alternate VM consoles.

---

### Listing the OS Configuration-EDT-Esoteric Hierarchy

Open the **Operating System Configuration** dialog by choosing **OS configurations...** from the **Edit** menu. The list box contains all OS configurations, EDTs and esoterics in a hierarchy in alphabetical order. You can double-click on an OS configuration (MVS only) with a plus (+) sign to display its EDTs; double-click on an EDT with a plus (+) sign to display its esoteric device groups. Double-click on an item with a minus (-) sign to close it. Double-clicking on an esoteric opens the **List Devices for Esoteric** dialog.

The static text fields below the list box display information for the item currently selected in the list box. If an OS configuration is selected, its name, type and description are displayed. If an EDT is selected, its ID, parent OS configuration,

description, time of last update, and updating user name are displayed. If an esoteric is selected, its name, parent OS configuration, state, token, and VIO-eligibility are displayed. The name of an esoteric follows the EE.SSSSSSSS format, where EE is the EDT name and SSSSSSSS is the esoteric name. The state of an esoteric can be one of the following:

- *no devices*
- *has devices*
- *no-DASD devices but VIO=YES*

You can access almost every dialog dealing with OS configuration from the **Operating System Configuration** dialog. You can create or edit OS configurations, EDTs or esoterics, as well as list and/or edit generics, consoles or the devices defined to the OS configuration or esoteric.

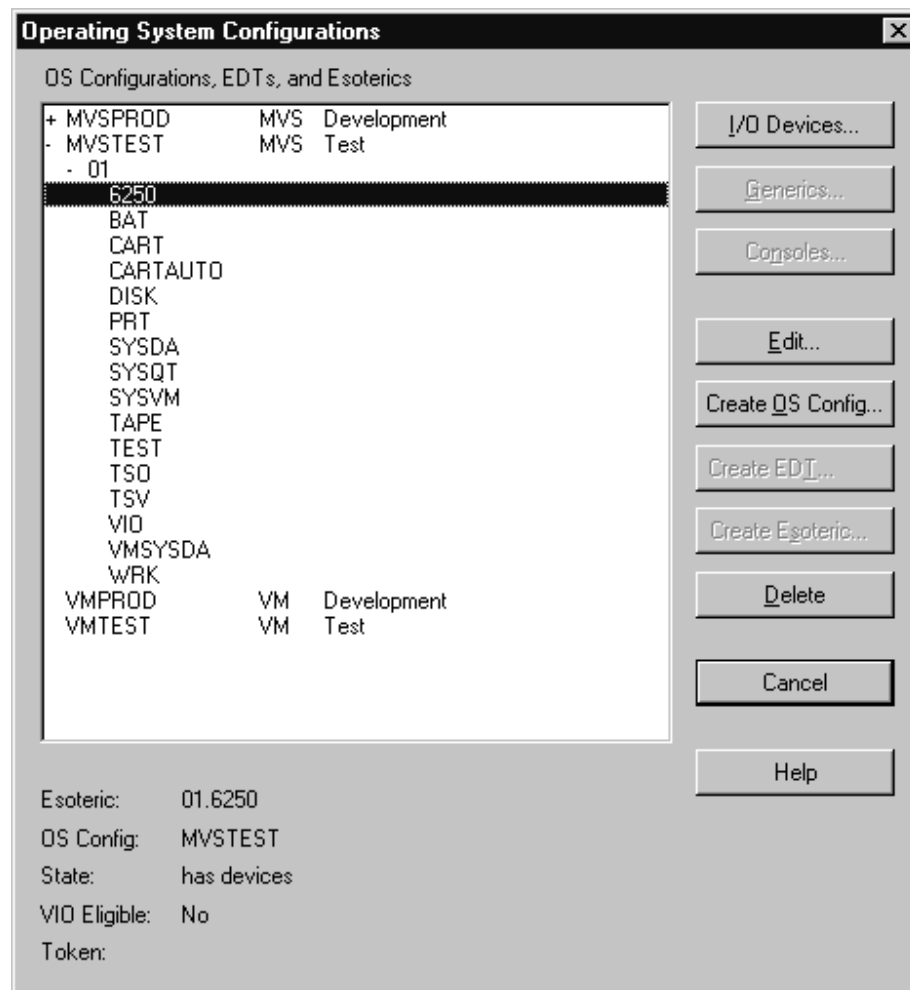


Figure 114. Operating System Configurations Dialog

## Creating an OS Configuration

Open the **Create Operating System Configuration** dialog by pressing the **Create OS Config...** button in the **Operating System Configurations** dialog. Fill in the name, type and description of the OS configuration and press **OK**; the new OS configuration will appear in the Operating System Configurations dialog box. After

you have created an MVS OS configuration, you can add EDTs and esoteric device groups under it, as well as define devices to it.

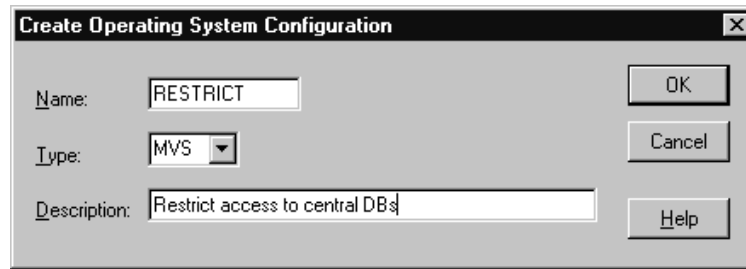


Figure 115. Create Operating System Configuration Dialog

## Editing an OS Configuration

Select an OS configuration and press the **Edit...** button in the **Operating System Configurations** dialog. The **Edit Operating System Configuration** dialog appears. Edit the description and press **OK**.

## Deleting an OS Configuration

Select the OS configuration in the list box and press the **Delete** button in the **Operating System Configurations** dialog. HCM will display a confirmation dialog before deleting the OS configuration.

## Listing Devices for an OS Configuration

Open the **List Devices for OS Configuration** dialog by selecting an OS configuration and pressing the **I/O Devices...** button in the **Operating System Configurations** dialog. The Devices list box in this dialog displays all the devices defined for the selected OS configuration. Groups of consecutive device numbers appear on one line each with a plus (+) sign. Double-click on a device range with a plus (+) sign to expand it to display each device on its own line. Double-click on a device range with a minus (-) sign to contract it. Note that the information on a device group line apply only to the first device in the group. It is possible, therefore, that other devices in the group may have column values that differ from the first device. To see the column values for individual devices, these entries must be expanded.

You can display the parameters, attached control units, serial numbers or descriptions for the devices by choosing the appropriate View option. If you choose the Parameters view radio button, you can select which parameters to display from the **Show Parameters / Features as Columns** dialog. Open this dialog by pressing the **Columns...** button. Add or remove parameters or features to or from the Exclude and Include list boxes. Default parameters displayed for MVS operating systems are "DYNAMIC" and "OFFLINE", for VM operating systems, "UIRATE" and "OFFLINE".

You can also choose to restrict the number of devices in the Devices list box by clicking in the Use Filter check box, and then selecting a set of filters from the **Filter I/O Device List** dialog (press the **Filter...** button to open the dialog). Devices which appear in the list box match all the filtering criteria that you set in this dialog. You can set the device type, class, serial number or description; connected, unconnected or specific control units; and/or the processor or partition. The Parameters / Features section at the bottom of the filtering dialog shows only those parameters or features selected in the **Show Parameters / Features** dialog

which you can use as filtering criteria. (The Parameters / Features section appears only when the filtering dialog is called from the **List Devices for an OS Configuration** dialog.)

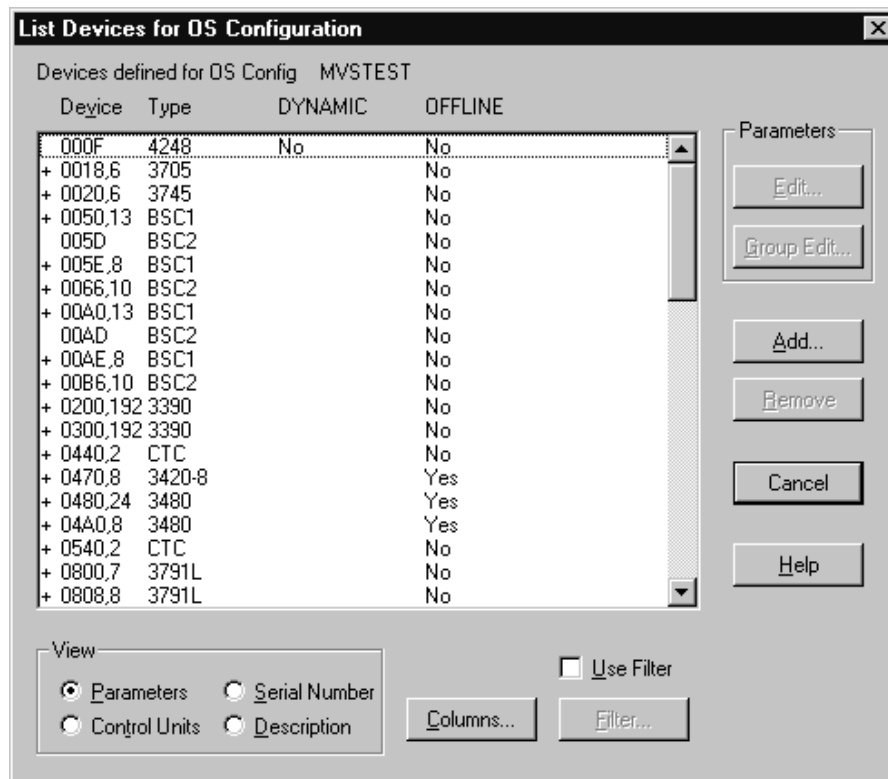


Figure 116. List Devices for OS Configuration Dialog

## Adding Devices to an OS Configuration

You can define devices to the selected OS configuration. In the **List Devices for an OS Configuration** dialog, press the **Add...** button to open the **Add I/O Devices to OS Configuration** dialog.

The list box in this dialog shows all devices defined in the IODF which are not currently defined to the selected OS configuration, and which match the current filter (if enabled). Groups of consecutive device numbers appear on one line each with a plus (+) sign. Double-click on a device range with a plus (+) sign to expand it to display each device on its own line. Double-click on a device range with a minus (-) sign to contract it. Note that the information on a device group line apply only to the first device in the group. It is possible, therefore, that other devices in the group may have column values that differ from the first device. To see the column values for individual devices, these entries must be expanded.

Select one or more devices and press **OK** to add them to the OS configuration. (Alternatively, double-click on the device.) The **Define Device <=> OS Configuration Parameters** dialog automatically appears, to allow you to update the parameters defining the connection between the device and the OS configuration. If you have selected more than one device, the parameters dialog appears only once, but any changes made to parameters apply to all selected devices. For more details, see “Editing Device <=> OS Configuration Parameters” on page 177.

You can determine what device information appears in the list box by selecting one of the View options: connected control units, device descriptions or serial numbers. You can also choose to restrict the number of devices which appear in the list box by using the filtering option (see “Listing Devices for an OS Configuration” on page 175 for more details on filtering).

Note that an Operating Systems section appears at the bottom of the **Filter I/O Device List** dialog only when the dialog is called from the **Add I/O Devices to OS Configurations** dialog. If you select the *No OS Filtering* option, all devices match and are displayed in the list box; if you select *Not Defined*, a device will match the criterion if it is *not* defined to any OS configuration; if you select *Defined*, a device will match if it is defined to any OS configuration.

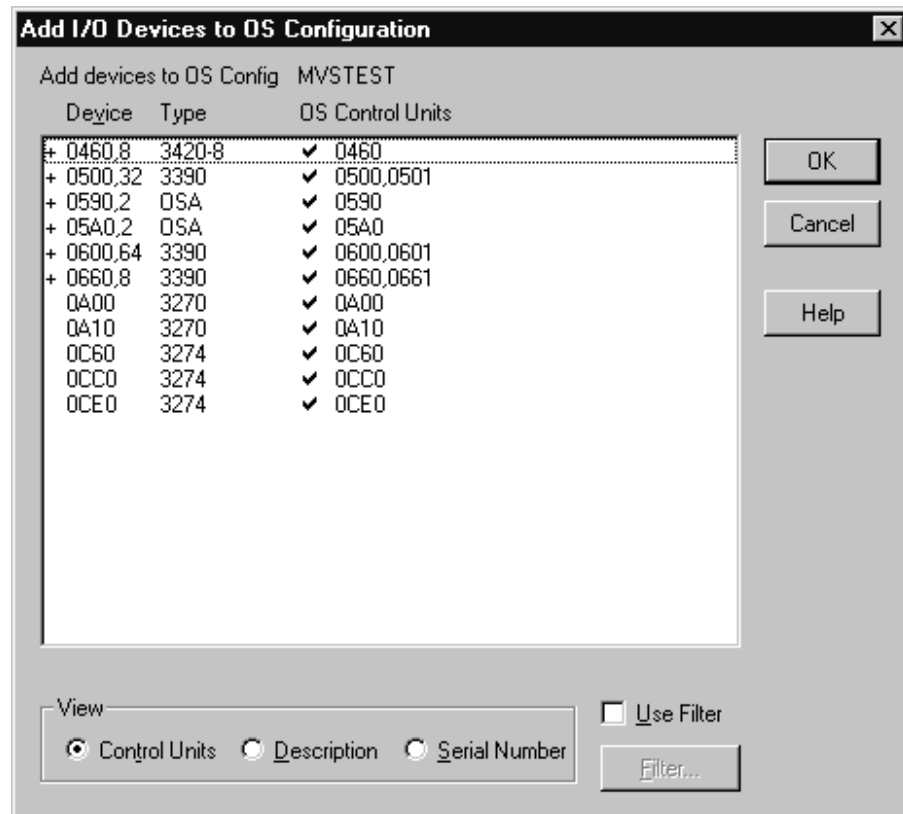


Figure 117. Add I/O Devices to OS Configuration Dialog

### Removing Devices from an OS Configuration

In the **List Devices for OS Configuration** dialog, select one or more devices and press the **Remove** button. HCM will display a confirmation dialog before disconnecting the selected device(s) from the OS configuration.

### Editing Device <=> OS Configuration Parameters

Select one or more devices from the list box in the **List Devices for an OS Configuration** dialog, and press either the **Edit...** or **Group Edit...** button to open the **Define Device <=> OS Configuration Parameters** dialog. You can then modify the parameters which define the selected device(s) to the OS configuration. If you selected more than one device and pressed **Edit...**, the parameters dialog appears repeatedly, once for each device. If you selected more than one device and pressed **Group Edit...**, the dialog appears only once, displaying the parameters for the first selected device. Any changes affect all selected devices. HCM will display an error

message if the selected devices are incompatible for a group edit (that is, they are of different types).

Parameter	Value	Req	Description
OFFLINE	<input type="checkbox"/>		Device considered online or offline at IPL
DYNAMIC	<input type="checkbox"/>		Device supports dynamic configuration
LOCANY	<input type="checkbox"/>		UCB can reside in 31 bit storage
SHARED	<input checked="" type="checkbox"/>		Device shared with other systems
SHAREDUP	<input type="checkbox"/>		Shared when system physically partitioned

Figure 118. Define Device <=> OS Configuration Parameters Dialog

You can also reach the parameters dialog from the **Add I/O Devices to OS Configuration** dialog or the **List Device <=> OS Configuration Definitions** dialog. See “Adding Devices to an OS Configuration” on page 176 or “Selecting OS Configurations to which to Define Devices” on page 179 for more details.

The static text fields at the top of the **Define Device <=> OS Configuration Parameters** dialog identify the device and OS configuration involved in the connection. In the Parameters section below, each row of information contains the parameter name, value, whether it is required, and a description. You can update the value of a parameter by selecting one from the drop down box, typing in a text box, or clicking in a check box, as appropriate. To get a more detailed explanation of a parameter’s meaning, click on the “?” button on its row.

### Listing OS Configurations to which Devices are Defined

You can select one or more devices and list the OS configurations to which those devices are defined. Open the **I/O Device List** dialog by clicking on the **I/O Devices...** button in the **String** dialog to display all devices for a selected string. Alternatively, click on the **I/O Devices...** button in the **Control Unit List** dialog (which is called from the **Controller** dialog) to display all devices for a selected control unit.

Select a device(s) from the **I/O Device List** dialog and press the **OS Configs...** button to open the **List Device <=> OS Configuration Definitions** dialog. The list box in this dialog displays all OS configurations available in the IODF. A check mark under the “Defined” column indicates the selected device is defined to the OS configuration. If more than one device is selected, the check mark only applies to the first device.

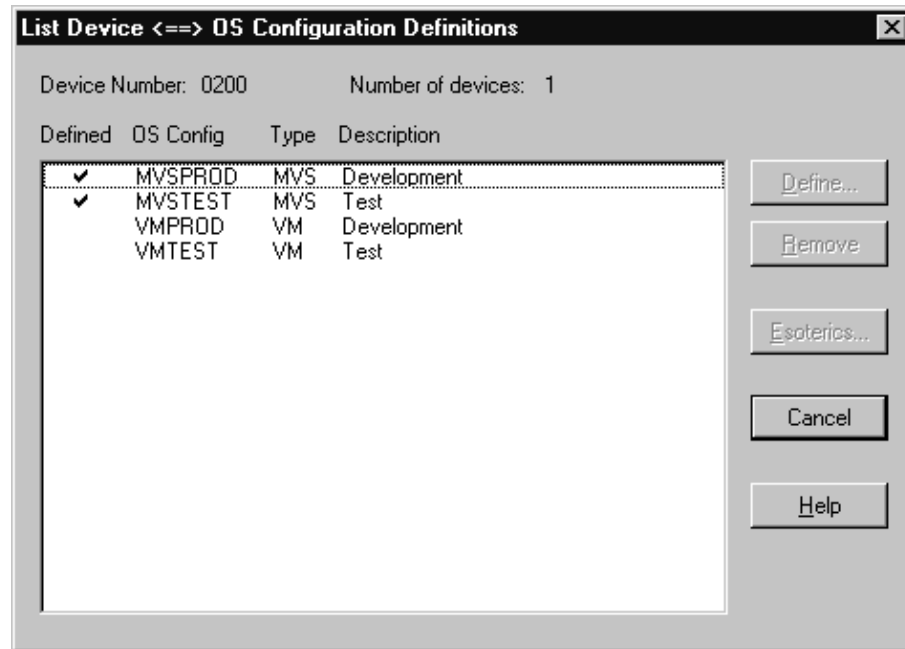


Figure 119. List Device <=> OS Configuration Definitions Dialog

### Selecting OS Configurations to which to Define Devices

You can select one or more OS configurations in the list box to define to the selected device(s). Press the **Define...** button to open the **Define Device <=> OS Configuration Parameters** dialog. You can then update the parameters determining the device <=> OS configuration definition. See “Editing Device <=> OS Configuration Parameters” on page 177 for more details on this dialog.

### Selecting OS Configurations from which to Remove Devices

Select one or more OS configurations and press the **Remove** button. HCM will display a confirmation dialog before removing the devices selected in the **I/O Device List** dialog from all selected OS configurations.

### Adding Devices to an Esoteric within the OS Configuration

Select an OS configuration(s) and press the **Esoterics...** button to open the **Include Devices in Esoterics** dialog. In this dialog, you can include (or exclude) the devices selected in the I/O Device List in esoteric device groups within the selected OS configuration. If you selected more than one OS configuration, the esoterics dialog appears repeatedly, once for each selection.

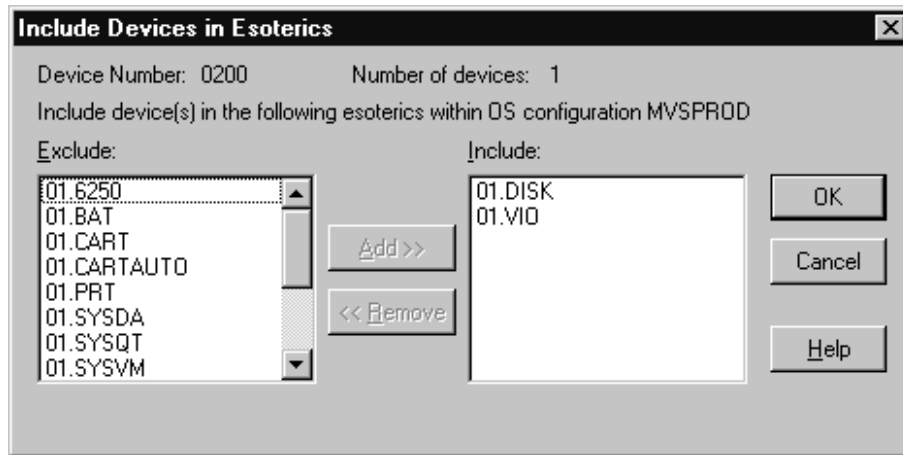


Figure 120. Include Devices in Esoterics Dialog

## Listing Consoles for an OS Configuration

Open the **List Consoles** dialog by selecting an OS configuration in the **Operating System Configurations** dialog and pressing the **Consoles...** button. The list box displays all the devices which have been marked as consoles for the selected OS configuration, organized by order number.

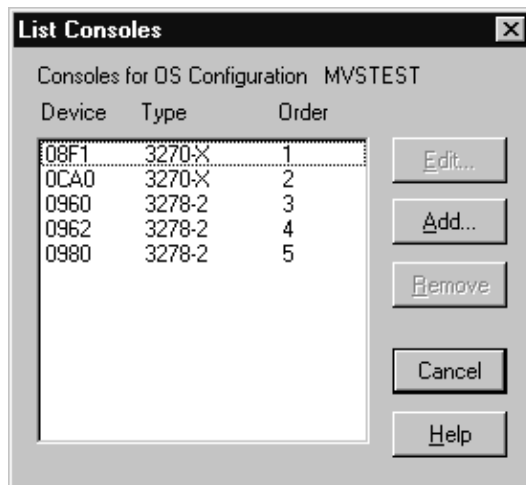


Figure 121. List Consoles Dialog

## Adding a Console to an OS Configuration

Press the **Add...** button in the **List Consoles** dialog to open the **Add Console** dialog. You can then select a device to define as a console for the selected OS configuration. The drop down box displays all devices defined to the OS configuration which are eligible to be used as consoles.

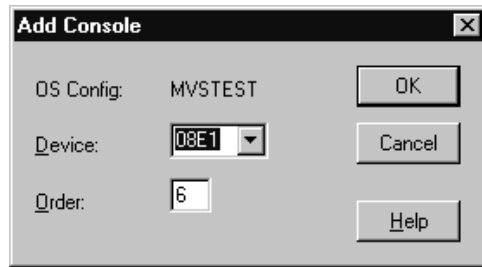


Figure 122. Add Console Dialog

### Removing a Console from an OS Configuration

Select the console and press the **Remove** button in the **List Consoles** dialog. HCM will display a confirmation dialog, then remove the console from the list box. The device is no longer marked as a console, but is still defined to the OS configuration.

### Editing a Console for an OS Configuration

Select a console from the **List Consoles** dialog and press the **Edit...** button. The **Edit Console** dialog appears to allow you to edit the order number for the selected console.

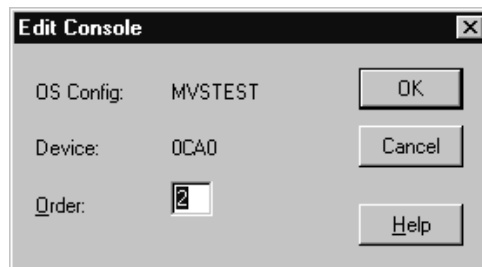


Figure 123. Edit Console Dialog

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## Eligible Device Tables (EDTs)

An MVS OS configuration can contain one or more EDTs. An Eligible Device Table or EDT is a list of esoteric device groups, plus the names of the generic device types which determine how devices are used (order of preference) within each esoteric. The EDT is identified by a two-digit ID; you must define at least one EDT for each MVS OS configuration.

### Creating an EDT

After you have created an OS configuration, you can create EDTs or Eligible Device Tables under it. Select an OS configuration (MVS only) and press the **Create EDT...** button in the **Operating System Configurations** dialog. The **Create Eligible Device Table** dialog opens, allowing you to specify an EDT name and description. After you press **OK**, the new EDT will appear in the list box of the **Operating System Configurations** dialog, under the selected OS configuration.

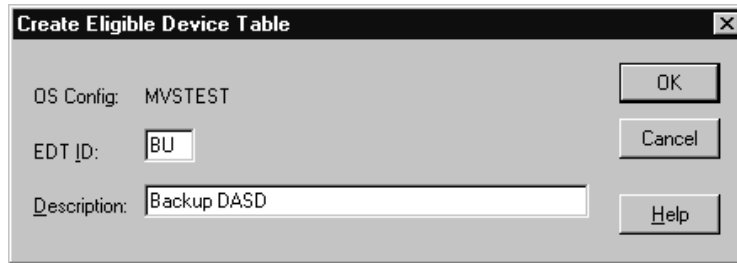


Figure 124. Create Eligible Device Table Dialog

## Editing an EDT

Select an EDT from the list box in the **Operating System Configurations** dialog and press the **Edit...** button. The **Edit Eligible Device Table** dialog appears, allowing you to edit the EDT description.

## Deleting an EDT

Select the EDT in the list box and press the **Delete** button in the **Operating System Configurations** dialog. HCM will display a confirmation dialog before deleting the EDT.

---

## Esoteric Device Groups (Esoterics)

An *esoteric device group* or *esoteric* is an installation-defined and named grouping of I/O devices under an EDT. An esoteric acts as a single “virtual device” which can be allocated without using a specific device number. Devices within an esoteric are usually from the same device group, but can be of different device types.

## Creating an Esoteric

After you have created an OS configuration and EDT, you can add esoteric device groups. Open the **Create Esoteric Device Group** dialog by selecting an EDT and pressing the **Create Esoteric...** button in the **Operating System Configurations** dialog. Fill in the name, token and VIO eligibility. After you press **OK**, the new esoteric will appear in the list box of the **Operating System Configurations** dialog, under the selected OS configuration and EDT.

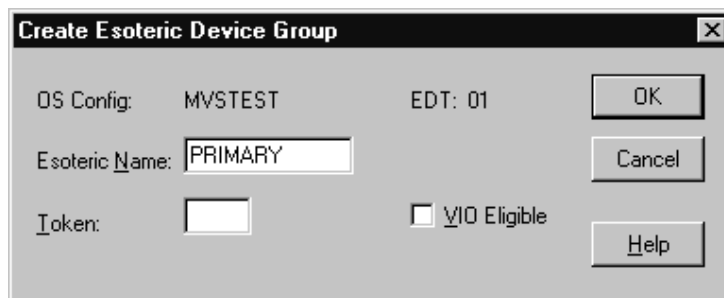


Figure 125. Create Esoteric Device Group Dialog

## Editing an Esoteric

Select an esoteric from the list box in the **Operating System Configurations** dialog and press the **Edit...** button. The **Edit Esoteric Device Group** dialog appears, allowing you to edit the esoteric token and VIO eligibility.

## Deleting an Esoteric

Select the esoteric in the list box and press the **Delete** button in the **Operating System Configurations** dialog. HCM will display a confirmation dialog before deleting the esoteric.

## Listing Devices for an Esoteric

Select an esoteric and press the **I/O Devices...** button in the **Operating System Configurations** dialog. The **List Devices for Esoteric** dialog appears, allowing you to examine the devices defined for the selected esoteric. List box entries may be either a single device or range of devices. Range entries use the format XXXX,YY where XXXX is the first device number and YY indicates the number of devices in the range. Double-click on a range with a plus (+) sign to expand it to display each device on its own line. This allows you to delete some but not all of the devices in the range. Double-click on a range with a minus (-) sign to collapse it.

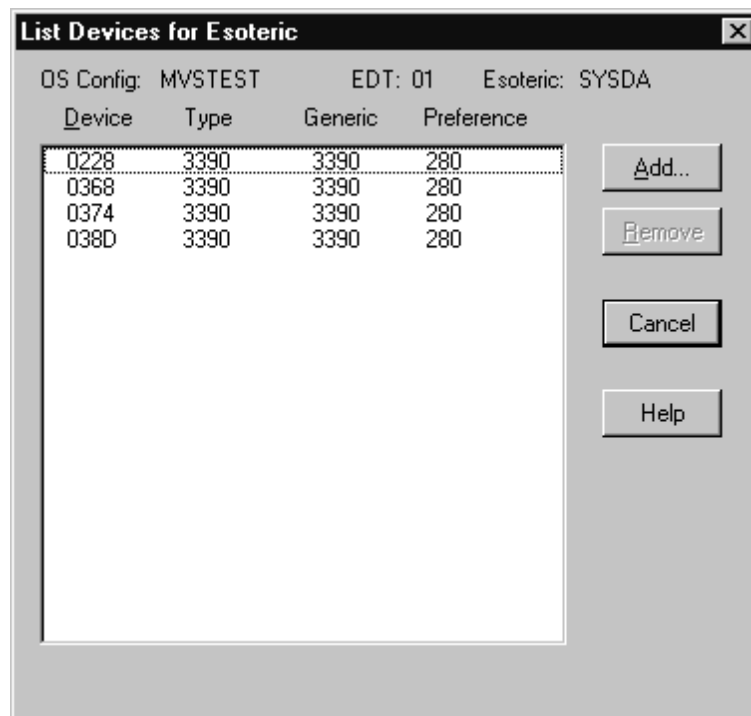


Figure 126. List Devices for Esoteric Dialog

## Adding Devices to an Esoteric

Open the **Add I/O Devices to Esoteric** dialog by pressing the **Add...** button in the **List Devices for Esoteric** dialog. You can then select one or more devices from the list box to add to the esoteric. The list box displays all devices currently defined to the OS configuration which contains the esoteric, and which match the current filter (if enabled). Groups of consecutive device numbers appear on one line each with a plus (+) sign. Double-click on a device range with a plus (+) sign to expand it to display each device on its own line. Double-click on a device range with a minus (-) sign to contract it. Note that the information on a device group line

apply only to the first device in the group. It is possible, therefore, that other devices in the group may have column values that differ from the first device. To see the column values for individual devices, these entries must be expanded.

You can determine what device information appears in the list box by selecting one of the View options: connected control units, device descriptions or serial numbers. You can also choose to restrict the number of devices which appear in the list box by using the filtering option (see “Listing Devices for an OS Configuration” on page 175 for more details on filtering).

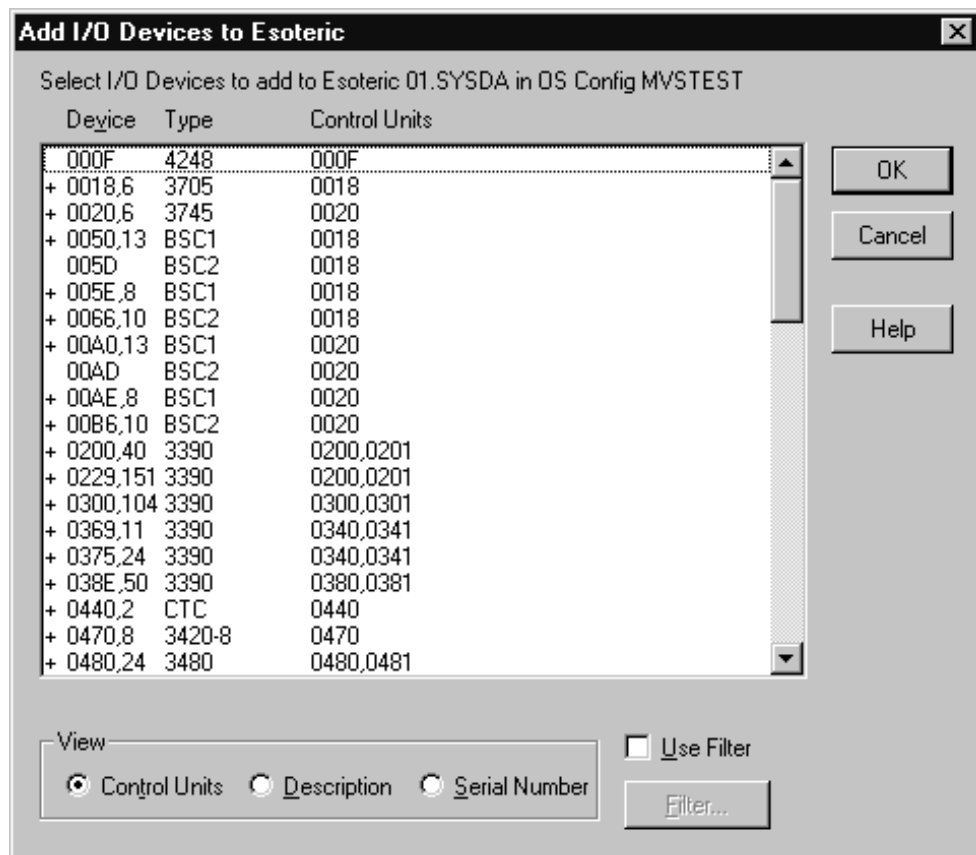


Figure 127. Add I/O Devices to Esoteric Dialog

### Removing Devices from an Esoteric

Select one or more devices and press the **Remove** button in the **List Devices for Esoteric** dialog. HCM will display a confirmation dialog before disconnecting the selected device(s) from the esoteric.

## Generic Device Groups (Generics)

Every device type is associated with a *generic device group* or *generic*. A generic is an MVS-defined grouping of devices with similar characteristics, which determines how devices are used in an esoteric device group. Each generic has a *preference number* which governs the order of allocation of devices to jobs within an esoteric. For example, if the esoteric contains the device types 3990, 3880 and 3850, and the generics associated with the device types have preference numbers 280, 290, and 300, respectively, then the preference numbers are used by the MVS allocation component to assign the devices in that order of preference.

Faster devices have lower preference numbers. You can change the preference number of a generic under an EDT (*user-defined generic*), but not under an OS configuration (*system-defined generic*).

## Listing System-Defined Generics

Open the **List System-defined Generics** dialog by selecting an MVS OS configuration and pressing the **Generics...** button in the **Operating System Configurations** dialog. You can then browse the list of generic device groups defined for the selected OS configuration. You can order the list by name or by preference by choosing the appropriate View option.

Note that you cannot edit system-defined generics (under an OS configuration), but you can change the preference number for *user-defined generics* (under an EDT).

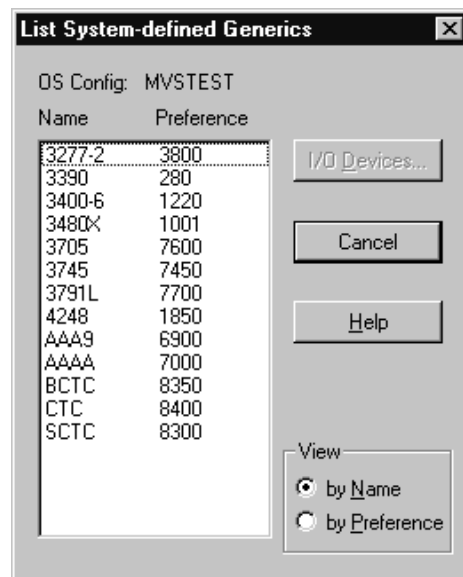


Figure 128. List System-Defined Generics Dialog

## Listing Devices for a System-Defined Generic

Select a generic and press the **I/O Devices...** button in the **List System-defined Generics** dialog. The **List Devices for Generic** dialog appears, allowing you to browse the list of devices associated with the generic.

## Listing User-Defined Generics

Open the **List User-defined Generics** dialog by selecting an EDT and pressing the **Generics...** button in the **Operating System Configurations** dialog. You can then browse the list of generic device groups defined for the selected EDT. The list box displays the generics by name or by preference, depending on which View option you choose.

Note that you can edit *user-defined generics* (defined under an EDT), but not *system-defined generics* (under an OS configuration).

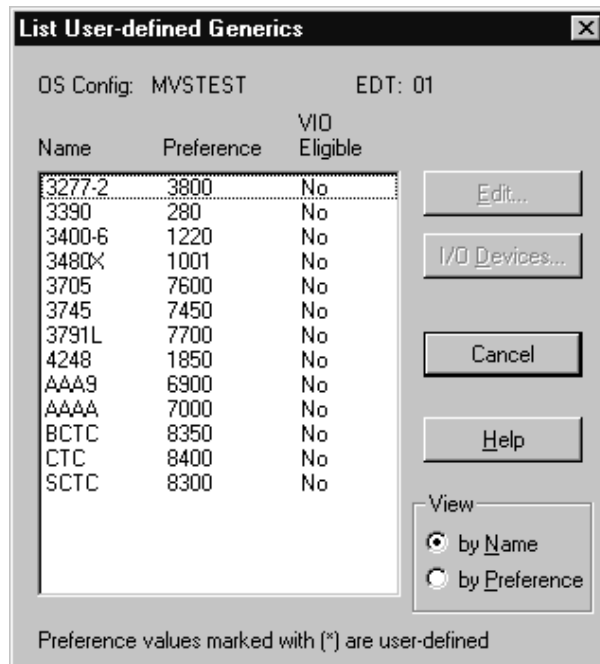


Figure 129. List User-Defined Generic Dialog

### Listing Devices for a User-Defined Generic

Select a generic and press the **I/O Devices...** button in the **List User-defined Generics** dialog. The **List Devices for Generic** dialog appears, allowing you to browse the list of devices associated with the generic.

### Editing a User-Defined Generic

You can change the preference value and VIO eligibility of a user-defined generic in the **Edit Generic** dialog. To display this dialog, select a user-defined generic and press the **Edit...** button in the **List User-defined Generics** dialog. Note that leaving the preference number text box blank and pressing **OK** will reinstate the system-defined preference number for the generic.

---

## Chapter 11. User Interface to I/O Operations

HCM provides additional capabilities which allow I/O Operations tasks on the host to be performed via HCM. To be able to perform these functions, I/O Operations must be up and running. The following functions are available with HCM:

- Viewing the active sysplex and the status of its objects graphically,
- Retrieving, manipulating and activating switch matrices,
- Issuing I/O Operations commands.

To carry out these functions, you must, of course, have the necessary RACF authorization to perform I/O Operations (see *System Automation for OS/390 User's Guide*). To view the status information of the active system, it is obvious that the active configuration must correspond with the HCM configuration. This is the responsibility of the user. If the HCM configuration does not represent the active IODF, misleading results will occur. Note that to manipulate an active switch matrix you require access to the active IODF.

**Note:**

These functions are not available if your system is running as a host under VM.

To access the I/O Operations on the host, the prerequisites mentioned under "I/O Operations Functions" on page 5 are necessary.

---

### Viewing the Active Sysplex and its Status

HCM knows the systems of the active sysplex (that is, the sysplex on which HCD is running) and associates them with partitions and processors (for basic mode). Because of this, partitions and basic mode processors can be labelled with their associated system name in the configuration diagram according to the **Operations Preferences** you have selected.

To display all the objects of the active sysplex, use the filter option in the **View** menu and select the **Active sysplex** checkbox. The resulting diagram will consist of the desired systems and their objects.

To see the status of the objects in the sysplex, use the menu item **Status** under the **Operations, Refresh** menu items. HCM now retrieves the status information via I/O Operations and shows it on the diagram in various colors having different meanings which can be defined in the **Color** dialog (see "Color Dialog" on page 190).

Detailed information for a selected object can be obtained by clicking on the object with the right mouse button and selecting **Status** in the upcoming popup menu.

If you do this for a Processor or Partition object, the following dialog appears.

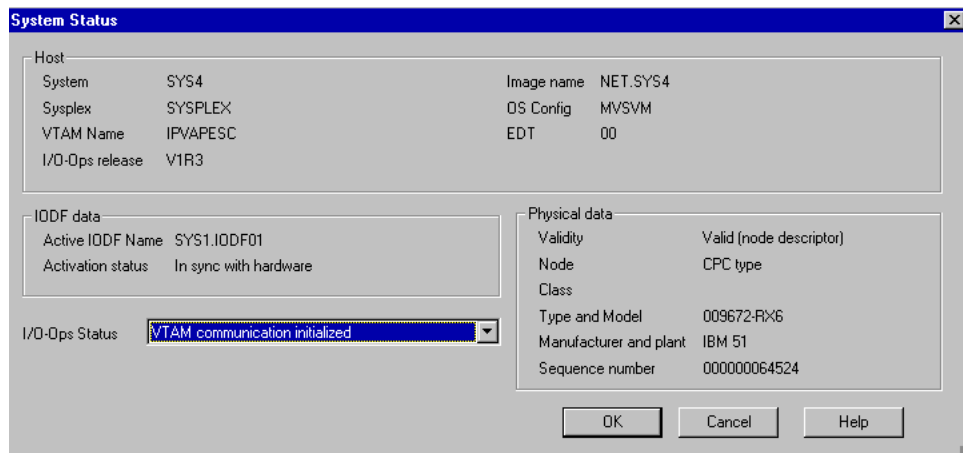


Figure 130. System Status dialog

The dialog shown in Figure 131 appears if you choose **Status...** from the popup menu for a string or a controller with integrated devices.

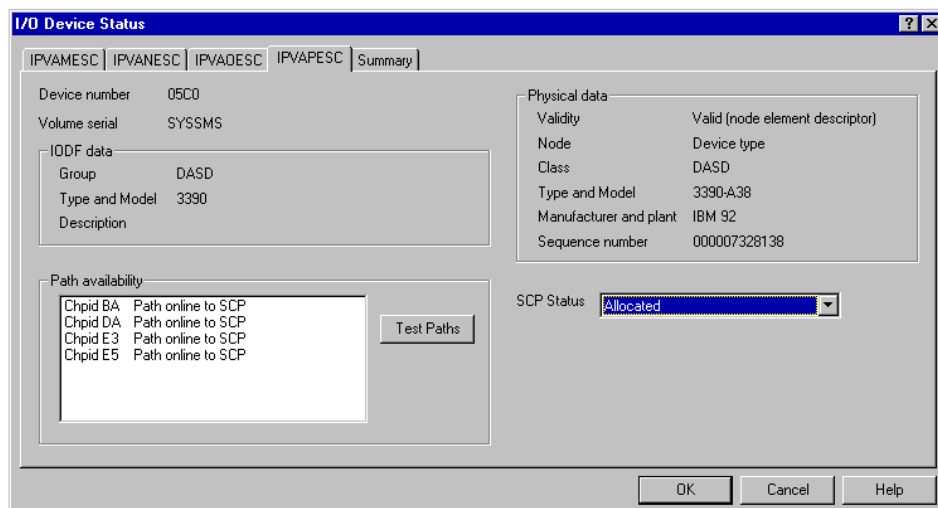


Figure 131. I/O Device Status

As an alternative to the popup menus, you can obtain the same information by selecting the **Status** button in the various Edit Object dialogs or dialogs that show lists of IODF objects, such as the **Partitions** dialog or the **I/O Device List** dialog. If you are showing the status on the **Configuration diagram** (see the documentation on the **Refresh, Status** menu option, below), and you return to the diagram after having obtained status information for an individual object, you will notice that a + sign will appear to the right of the time stamp in the status bar at the bottom of the screen. This indicates that the status of one or more objects in the diagram is more recent than the indicated time of the last refresh.

In addition to the above, there are some special menu items for viewing your configuration or invoking dialogs that are of particular significance in connection with the I/O Operations tasks. Most of these are to be found under the main menu item **Operations** and are explained below.

## Operations Menu

The items of this top level menu item are enabled whenever you are logged on to HCD (i.e. not in stand-alone mode). It will appear to the left of the **Utilities** menu. The Operations feature of HCM consists of the following menu items:

1. **Refresh** This command is the primary means by which the data about the system status is obtained. This information is *volatile* i.e. it is not remembered across different HCM sessions, and if you change the **Focus on host**. The **Refresh** menu consists of the following four submenus:
  - **Status** This refreshes the status information for all objects in the configuration diagram. This allows you to see the changes you have made to the active sysplex by showing the updated objects in a different color. The status bar at the bottom of the screen will display the time at which this command was issued.
  - **Sysplex** This refreshes the current contents of the Sysplex without updating the status bar refresh timestamp. This command is issued implicitly whenever a configuration is opened, but the menu option is also provided so that the command can be manually issued to detect changes to the Sysplex or changes to the availability of I/O Operations that may have occurred during the session.
  - **Switch configurations** This refreshes the visualized matrix data for matrices that are being used in the current diagram. If one or more matrices are not available, messages will appear to tell the user that these matrices cannot be visualized. Visualization will proceed as if *none* had been selected as the Visualized Configuration for the affected switches. This action will automatically issue a "Refresh Sysplex" if one has not yet been issued. The status bar refresh timestamp is unaffected by this command.
  - **All** This refreshes all of the above information. The status bar refresh timestamp is updated by this command.
2. **Sense** This command is the only means by which "Sensed" data from the host is obtained. The menu item consists of three submenus listed below. Data obtained by the Sense operation appears in the appropriate columns of the **Edit/Locate** dialogs. This action will automatically issue a "Refresh Sysplex" if one has not yet been issued.
  - **Selected** This refreshes sensing information for the object(s) selected in the diagram.
  - **Visible** This refreshes information for all objects visible in the diagram.
  - **All** This refreshes sensing information for all objects in the configuration. Since this is likely to be a very long operation, a confirmation dialog will appear. The sensed information is stored in the HCM config file and is *non-volatile*. Hence, it is retained across HCM sessions. This information is also available in all List Boxes in which a **Columns** button is to be found e.g. the **Edit** and **Locate** dialogs.
  - **Clear Previous Sensing Data** This clears the sensed information for all objects in the configuration.
3. **Focus on host** This dialog allows you to select the host for which the status information is to be displayed.
4. **Next focus host** This is a shortcut to select (from the list that would appear in the Focus on host dialog) the next host as the focus host.
5. **Command...** This starts the I/O Operations command dialog which not only allows you to issue I/O Operations commands but also allows you to view the results of them (see "Issuing I/O Operations Commands" on page 191).

6. **Preferences...** This dialog allows you to set various preferences specific only to the Operations feature of HCM e.g. the format of the system name is selected here.

## Color Dialog

This dialog allows you to assign the colors shown in the configuration diagram to the features they represent. It is called by the **View, Colors...** menu item. This dialog allows you to allocate your own colors for warnings and status.

If the user has selected the **Show status on diagram** checkbox in the **Colors** dialog, then the **Refresh, Status** menu option can be used to color objects to reflect status information with respect to the focus host. The following objects on the HCM diagram will be affected by the coloring:

- CHPIDs - Color will be determined by the status of the CHPID itself plus the SCP status of all CTC (or BCTC) devices that represent the CHPID in CTC connections to the focus host.
- Switches - Color will be determined by the operating status of the switch plus the SCP status of the switch's device.
- Integrated controllers - Color will be determined by the SCP status of the devices that the controller contains.
- Units within strings - Color will be determined by the SCP status of the devices that the unit contains.

Where more than one state or visual warning needs to be presented, the single most important state will be shown. Furthermore, for units and integrated controllers there will usually be more than one IODF object contained in the physical object. In such cases, the color displayed will reflect the status of the contained object with the most important state.

The status colors remain in effect on the diagram *as long as the view contains only objects that were visible at the time of the last status refresh*. The status time stamp in the status bar reflects this time. However, as soon as the view changes to include objects that were not visible when the time stamp was updated, then the coloring (and the time stamp) will be cleared.

This means that you can filter the diagram to show a large set of objects (e.g. all DASD in the active sysplex), invoke **Refresh, Status** once, and then switch back and forth between this larger view and views that show only subsets (e.g. use F4 to crop to one controller, and then F3 to go back to the larger view) without invalidating the status information. As soon as another object is shown in the view (e.g. a tape controller), then the colors and the status time stamp will be cleared, and "Refresh Status" would have to be issued again to show the status colors.

---

## Manipulating and Activating Switch Matrices

Switch matrices can reside inside an IODF or on a switch. HCM supports the manipulation of both kinds of matrices. Switch matrices that reside on switches can be listed, examined, modified, created or deleted in the same way as IODF matrices can. Every existing matrix is tagged with a label that indicates where it resides (in IODF or on a switch). When creating a matrix you can specify whether to place it in an IODF or on a switch.

The active switch configuration is treated in the same way as other switch configurations. It can be recognized by a special marker.

Certain restrictions apply to the manipulation of switch matrices. When access to the switch matrices is not possible, HCM informs the user accordingly.

HCM can activate any of the matrices that it can manipulate. This includes the active matrix. HCD will ensure that HCM can activate a matrix only when the active IODF is open.

## Issuing I/O Operations Commands

HCM offers a facility of passing I/O Operations commands to the HCD server. To issue I/O Operations commands, open the following **I/O Operations Command** window which can be found under the menu item **Operations, Command**.

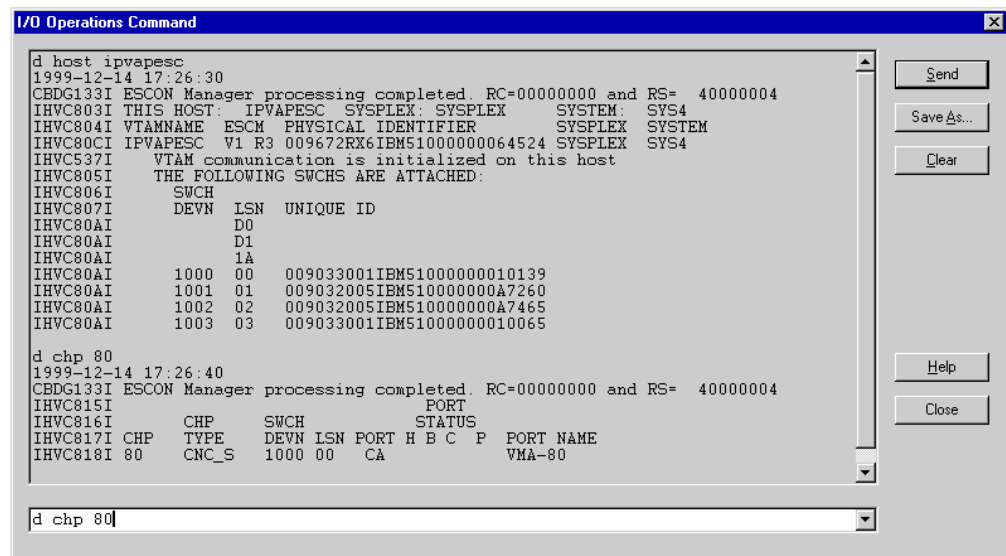


Figure 132. I/O Operations Command window

In this window, you can enter commands that will be passed on to I/O Operations. The response of the executed command is then displayed in the window. You can scroll in the buffer to display the last few responses and save them to a file. To clear the buffer, click on the **Clear** button. It is also possible to retrieve the last few commands for executing again if necessary.

For valid I/O Operations commands see *System Automation for OS/390 Operator's Commands*.

The return and reason codes resulting from the execution of the I/O Operations command are shown in the message CBDG133I. These codes are explained in *System Automation for OS/390 Messages and Codes*.



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## Chapter 12. Reports and Diagrams

HCM can produce a wide selection of reports and diagrams on a variety of printing devices, including plotters. Using the Windows print driver, HCM can work effectively with all printing devices supported by Windows. Since HCM is aware of the paper dimensions in the active printer, changing the paper size or orientation (portrait / landscape) will affect the appearance of the configuration diagram on the screen.

Use a printer resolution of 75 or 150 dpi (dots per inch): the graphics will print faster, although text is unaffected. Note that printing at 300 dpi or higher will require more printer memory. If this exceeds the capacity of your printer, print at a lower resolution.

HCM supports printing of hard copies in the same colors that appear on the screen.

**Tip:**

Some laser printers may print selected connections as patterned lines; you can generally force the printer to print solid lines by adjusting the printer driver settings.

**Tip:**

Before printing context diagrams, turn off the display of cabinets using the **View** menu. This will reduce the number of pages per context diagram.

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### Printing Configuration Diagrams

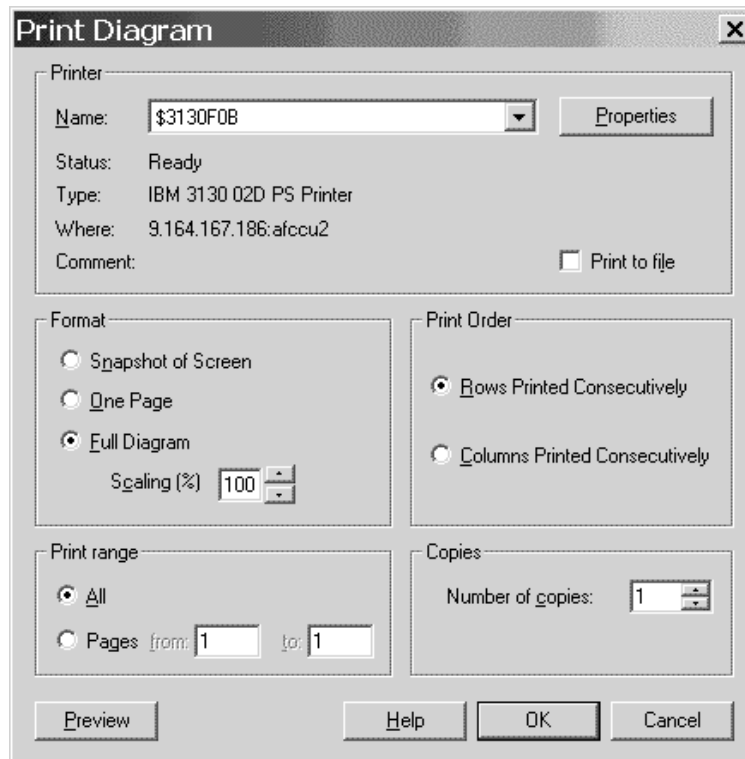
You can print configuration diagrams with the **Print Diagram...** command under the **File** menu. Configuration diagrams can be very large; you can reduce the number of pages needed by using legal sized paper (8 1/2" x 14") in landscape or portrait mode. You can print either the entire current diagram of the configuration diagram or a particular subset.

First ensure the current configuration diagram contains all the objects you want to print in the current view. Open the **Page Setup** dialog by choosing the **Page Setup** option in the **File** menu; select either Portrait or Landscape in the Orientation section. Clicking on the Printer button allows you to select the printer of your choice.

In the **Print Diagram** dialog, you can choose to print the exact portion of the diagram that appears on the screen, print the entire diagram on a single page, or scale the size of printed diagram.

**Tip:**

Screen snapshots typically look best if printed in Landscape mode.



There are three options for printing the configuration diagram.

- **Snapshot of Screen.** Prints the exact portion of the configuration diagram that appears on the screen. Use this to produce diagrams of a particular subset of the configuration.
- **One Page Preview.** Prints the configuration diagram on one page, giving you an overview of the entire diagram. Note that configurations printed on one page will be difficult to read.
- **Full Diagram.** Prints the diagram over several pages, if necessary, at the scale specified in the Page Count section. You can select any scaling factor between 20% and 100%. Use the **Preview** button to determine how many pages will be required to print the diagram at the specified scale. Note that the **Show Page Breaks** option on the **View** menu only shows where page breaks will occur if the diagram is printed at 100%.

**Tip:**

The most readable diagrams are those printed at 100% scale. Diagrams printed with small scales (e.g. less than 50%) or with One Page Preview are more difficult to read.

## Printing Reports and Context Diagrams

You can print reports and context diagrams using the **Print Reports** command under the **File** menu. A *context diagram* is a configuration diagram showing one particular object of interest and the equipment connected to it. Think of a context diagram as the configuration from the point of view of this object.

In the standalone mode you can only print reports of production configuration files. See “Printing Reports, Diagrams, Cable Labels” on page 72.

Open the **Printer Setup** dialog by choosing **Printer Setup...** from the **File** menu. Click the Setup option and select Portrait in the Orientation section.

Open the **Print Reports** dialog by choosing **Print Reports...** from the **File** menu. This dialog allows you to set parameters for the report you are printing. You can specify the report’s title, two footnotes, and whether to include: cover page, table of contents, and index, as well as which sections will be in the body of the report and which objects will be reported on.

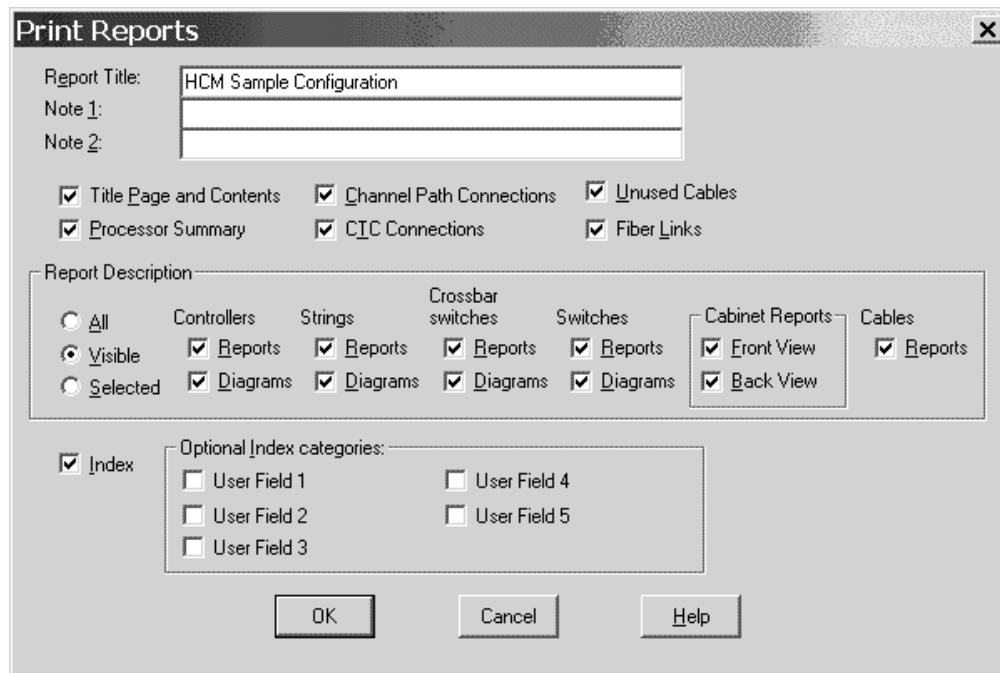


Figure 133. Print Reports Dialog

You can compose a report by including any or all of the following sections:

- **Title Page and Contents.** The title page contains the Report Title and Notes. The table of contents lists the sections that you include and the pages where each begins. Normally this option is included, but you may want to suppress these pages when printing reports on individual objects. To edit the title and footnotes that appear in the configuration diagrams and reports, open the **Titles and Footnotes** dialog of the **Edit** menu. Enter your values and press **OK**.
- **Processor Summary.** For each processor, prints a short summary that includes a description, and lists of partitions and CHPID types.
- **Channel Path Connections.** For each processor, prints a detailed CHPID report which describes the attached controllers and cable IDs.

- **CTC Connections.** Prints a detailed CTC report on all point-to-point CTCs and switched CTCs.
- **Fiber Links.** Prints a detailed report of all patchports and cables in each fiber link. The report is divided into sections for each type of ESCON or FICON object.
- **Controllers, Strings, Crossbar switches, ESCON or FICON switches, Cabinets, Cables** Specifies the types of objects for which detailed reports and context diagrams will be printed. You can choose to print reports and/or context diagrams for each object category selected. In addition, you can choose to print documentation for all objects in the object categories specified, only those visible (included) in the configuration diagram, or only those selected in the diagram.
- **Index.** Prints a detailed index for the report. The Optional Index categories section allows you to Include user data fields as index items. For example, clicking on user data 1 which is, say, "Asset Mgmt #" will result in all objects being indexed by asset number.

**Tip:**

To print a context diagram of some or all CTC connections, choose **Filter diagram...** from the **View** menu and exclude all controller types except for CTC. You may also want to turn off the **Show All CHPIDs** option to ensure no extra objects are drawn simply because they are not yet connected to controllers. For indirect (via switches) CTCs, select the processors before printing. This will show the internal connectivity within the switches. Print the context diagram using the One Page Preview or Snapshot of Screen options in the **Print Diagram** dialog.

**Tip:**

If the Channel Path Connections option is selected, HCM will produce a full index because the entries in the index are determined by the objects referenced in a given report request.

## Sample Reports and Context Diagrams

The following pages contain one example of each type of report and context diagram that can be printed by selecting **Print Reports...** from the **File** menu.

## Processor Summary

### BOESYS 9672-R41 "OS/390 Development System" [BS]

Mode: LPAR

Support level: Parallel, ESCON (CBY), OSA channels

SN:0000009672

Asset Mgmt #: 8337539-77835

Location: Main Complex

#### Partitions (by image number)

1 TEST 1 OS

2 PROD 2 OS

CHPID	Type	# of		Partition Numbers	
		Devices	Mode	1	2
20	CNC	0	SHR	A	A
21	CNC	64	SHR	A	A
22	CNC	64	SHR	A	A
23	CNC	64	SHR	A	A
24	CNC	64	SHR	A	A
25	CNC	128	SHR	A	A
26	CNC	128	SHR	A	A
27	CTC	16	SHR	A	A
28	CNC	144	SHR	A	A
29	CVC	8	REC	C	A
2A	BL	2	DED		A
2B	BL	32	REC	A	C
2C	BL	0	REC	A	C
2D	BL	0	DED		A
2E	BL	8	DED		A
2F	BL	0	REC	A	C
30	BL	0	DED		A
31	BL	8	DED		A
32	BL	1	DED		A
33	BL	1	DED	A	
34	BL	32	DED		A
35	BL	1	REC	A	C
36	BL	32	DED		A
37	BL	8	DED		A
60	BL	0	DED		A
61	CTC	4	DED		A
62	BL	0	DED		A
63	BY	0	DED		A
64	BL	32	REC	A	C
65	BL	1	REC	A	C
66	CNC	4	DED		A
67	BL	8	DED		A
68	BL	0	DED		A
69	BL	0	DED		A
6A	BL	8	DED		A
6B	BL	0	DED		A
6C	BL	32	REC	A	C
6D	BL	32	DED		A
6E	BY	0	DED		A

#### LEGEND FOR PARTITION NUMBERS FIELD:

A --- Partition in CHPID's Access and Candidate lists

C --- Partition in CHPID's Candidate list only

BLANK --- Partition not in CHPID's Access or Candidate lists

**CF1 9674-C04 "Coupling Facility" [C1]**

Mode: LPAR  
Support level: CFR channels  
SN:3765249674

**Partitions (by image number)**

1 CFLPAR1 1 CF "Coupling Facility #1, Room 7A-45"

		# of		Partition Numbers	
CHPID	Type	Devices	Mode	1	
00	CFR	0	DED	A	
01	CFR	0	DED	A	
04	CFR	0	DED	A	
05	CFR	0	DED	A	

**LEGEND FOR PARTITION NUMBERS FIELD:**

A --- Partition in CHPID's Access and Candidate lists  
C --- Partition in CHPID's Candidate list only  
BLANK --- Partition not in CHPID's Access or Candidate lists

## Channel Path Connections

**BOESYS 9672-R41 "OS/390 Development System"**  
SN:0000009672

Asset Mgmt #: 8337539-77835  
Location: Main Complex

### 20 S CNC SHR

Access: PROD, TEST

F S in 3745-61A reaching String 00A0-00AC String 00AD ...

### 21 S CNC SHR

# of Devices: 64

Access: PROD, TEST

SC0 A S in 3990-006-600 reaching RAMAC600  
IBM 3990 Model 6 DASD Controller  
SN:13-93420

### 22 S CNC SHR

# of Devices: 64

Access: PROD, TEST

SC1 A S in 3990-006-600 reaching RAMAC600  
IBM 3990 Model 6 DASD Controller  
SN:13-93420

### 23 S CNC SHR

# of Devices: 64

Access: PROD, TEST

SC0 B S in 3990-006-600 reaching RAMAC600  
IBM 3990 Model 6 DASD Controller  
SN:13-93420

### 24 S CNC SHR

# of Devices: 64

Access: PROD, TEST

SC1 B S in 3990-006-600 reaching RAMAC600  
IBM 3990 Model 6 DASD Controller  
SN:13-93420

### 25 S CNC SHR

# of Devices: 128

Access: PROD, TEST

mmf1080 85 MM Jumper

SWCH\_5 A9

SN:1234567890

**26 S CNC SHR**

# of Devices: 128

Access: PROD, TEST

mmfl078 85 MM Jumper

SWCH\_5 A2

SN:1234567890

**27 S CTC SHR**

# of Devices: 16

Access: PROD, TEST

mmfl079 85 MM Jumper

SWCH\_5 A6

SN:1234567890

**28 S CNC SHR**

# of Devices: 144

Access: PROD, TEST

mmfl081 85 MM Jumper

SWCH\_5 AA

SN:1234567890

**29 S CVC REC**

# of Devices: 8

Access: PROD

Candidate: (TEST)

SWCH\_5 AB

SN:1234567890

**2A P BL DED**

# of Devices: 2

Access: PROD

A P in 3274-41D-CE0 reaching CRTCE0

SN:86588

A P in 3274-41D-CC0 reaching CRTCC0

SN:D2128

**2B P BL REC**

# of Devices: 32

Access: TEST

Candidate: (PROD)

SC0 B P in 3990-003-500 reaching String 500

IBM 3990 Model 3 DASD Controller

SN:32160

**2C P BL REC**

Access: TEST  
Candidate: (PROD)

A P in 6262 #2 Not connected

**2D P BL DED**

Access: PROD

C P in 3745-210 reaching String No Devices String 0918-091B

**2E P BL DED**

# of Devices: 8  
Access: PROD

SCI C P in 3990-003-660 reaching String 660  
IBM 3990 Model 3 DASD Controller  
SN:33246

**2F P BL REC**

Access: TEST  
Candidate: (PROD)

B P in 3480-A22-480 reaching String 0480-0487 String 0488-048F  
IBM 3480 Tape Controller

**30 P BL DED**

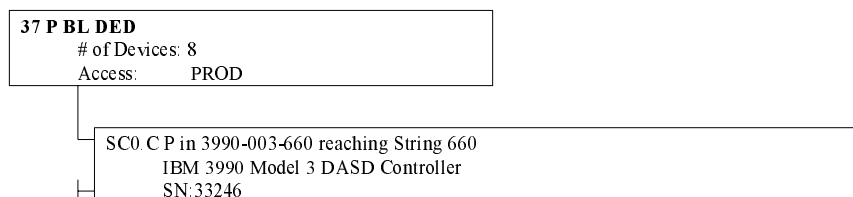
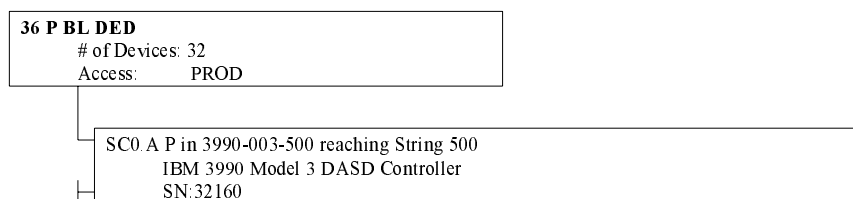
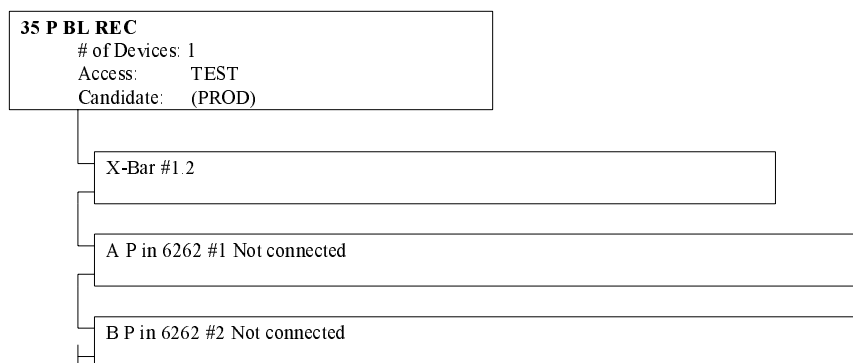
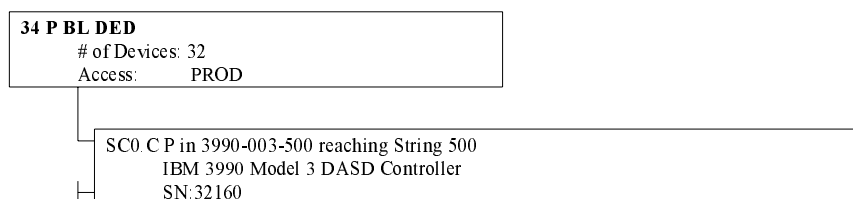
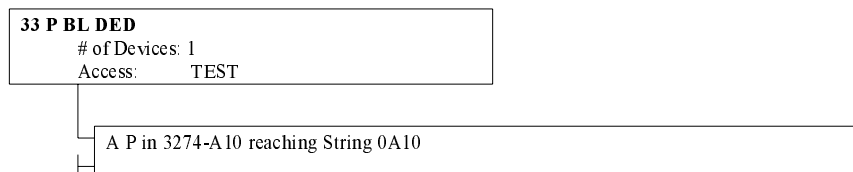
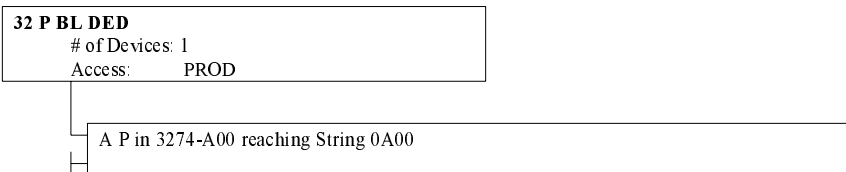
Access: PROD

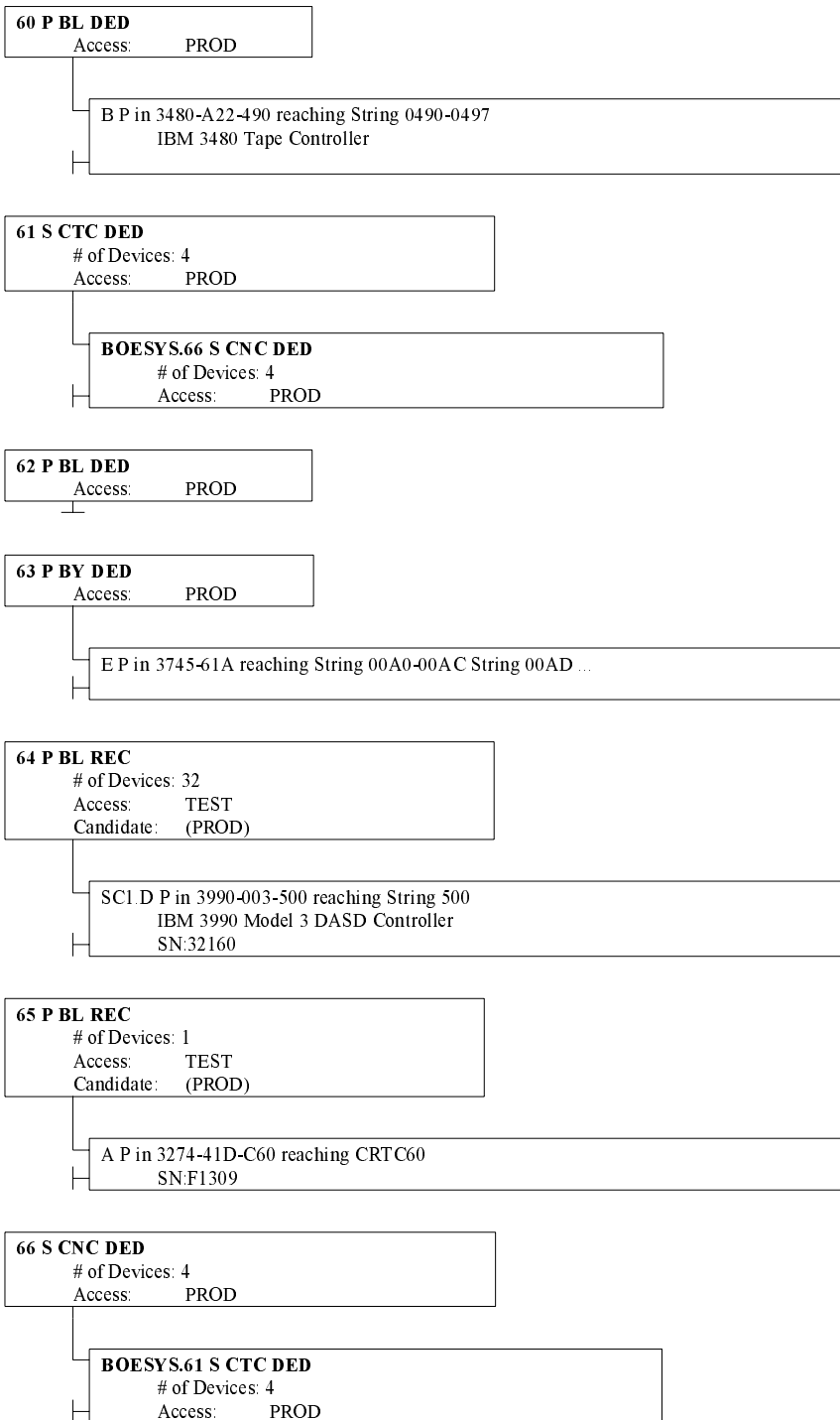
C P in 3480-A22-480 reaching String 0480-0487 String 0488-048F  
IBM 3480 Tape Controller

**31 P BL DED**

# of Devices: 8  
Access: PROD

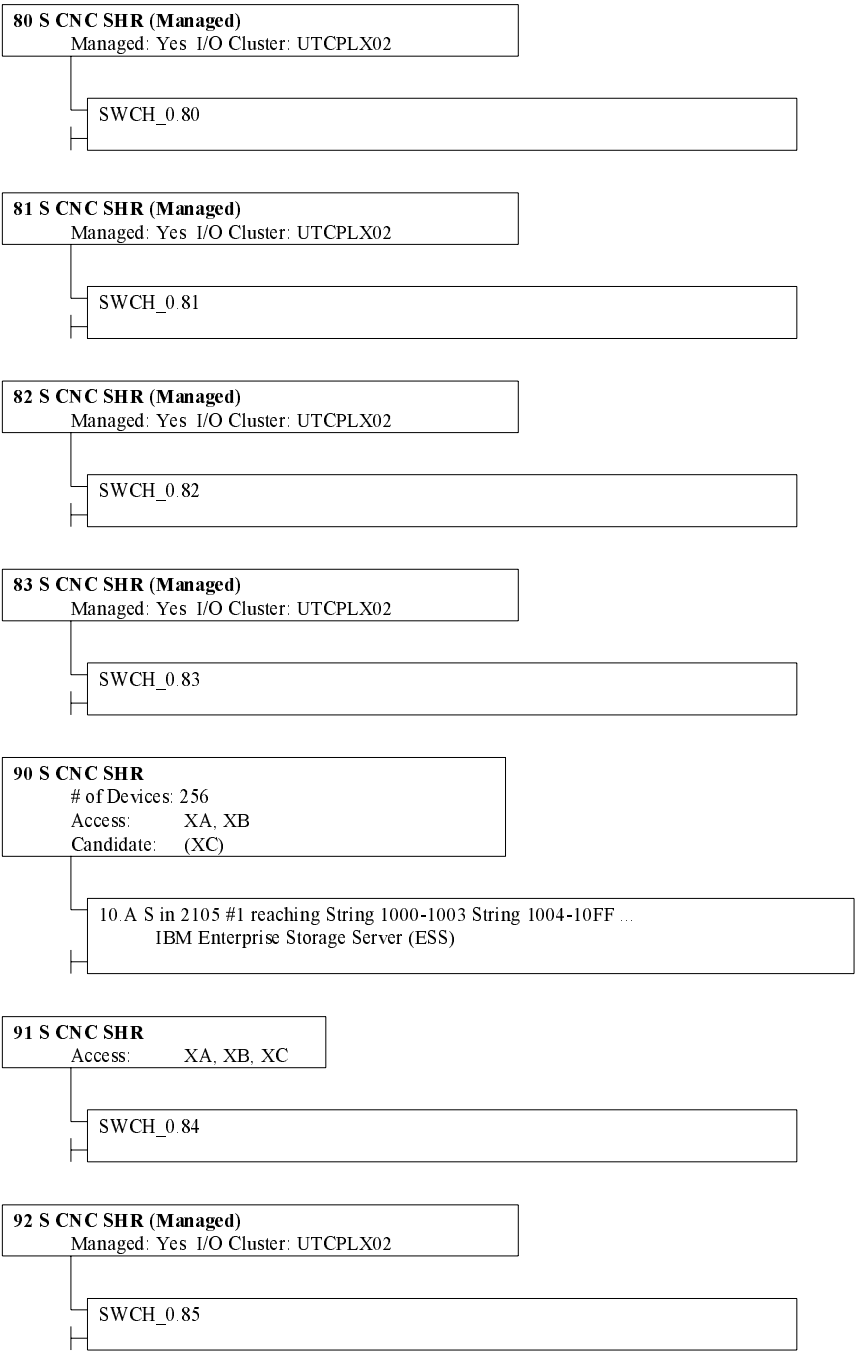
SC0 B P in 3990-003-660 reaching String 660  
IBM 3990 Model 3 DASD Controller  
SN:33246

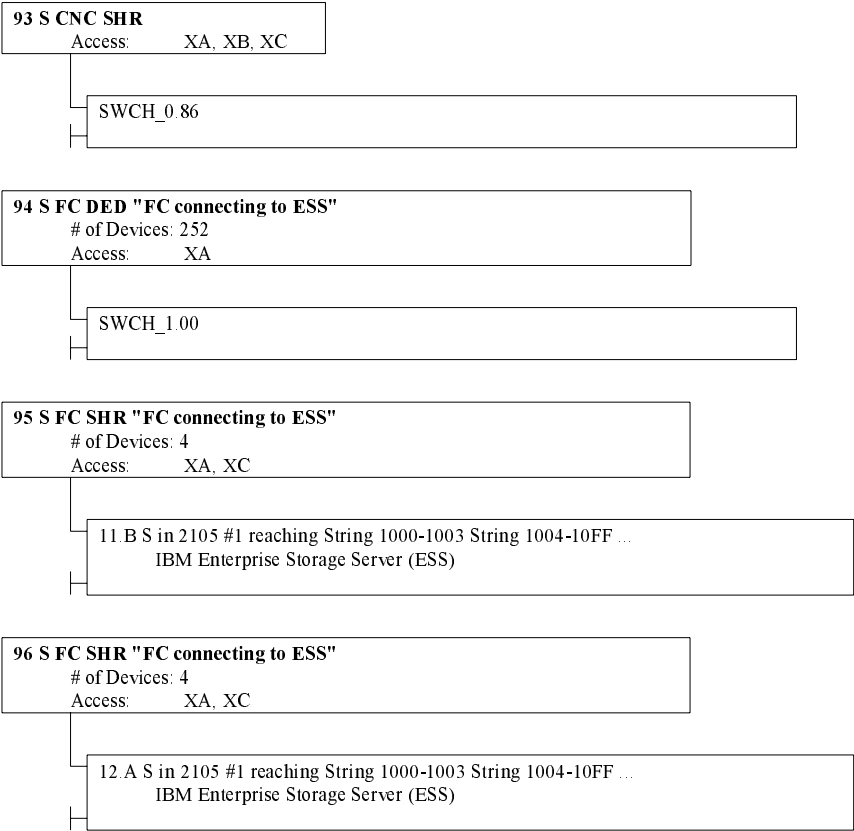




Channel Path Connections

ESERVER 2064-112 "eServer z900"





## Channel-to-Channel Connections

### CTC Connection

From CTC or FC CHPID: BOESYS.27 S CTC SHR  
 Route: ESCD\_5(A6..AA)  
 From CNC/FCV or FC CHPID: BOESYS.28 S CNC SHR

#### Details:

Image on BOESYS	Control Unit	Devices	OS	UA	Devices	OS	Control Unit	Image on BOESYS
TEST	0D02							TEST
PROD	0D02	0D00,8 (B)	Y	00	0D00,8 (B)	Y	0D03	TEST
PROD	0D02	0D08,8	Y	08	0D08,8	Y	0D03	TEST
PROD							0D03	PROD

### CTC Connection

From CTC or FC CHPID: BOESYS.61 S CTC DED  
 Route: Point-to-Point  
 From CNC/FCV or FC CHPID: BOESYS.66 S CNC DED

#### Details:

Image on BOESYS	Control Unit	Devices	OS	UA	Devices	OS	Control Unit	Image on BOESYS
PROD	1000	1000,4		00	1005,4		1005	PROD

### CTC Connection

From CTC or FC CHPID: ESERVER.A1 S FC SHR  
 Route: ESCD\_40(A1..B1)  
 From CNC/FCV or FC CHPID: ESERVER2.B1 S FC SHR

#### Details:

Image on ESERVER	Control Unit	Devices	OS	UA	Devices	OS	Control Unit	Image on ESERVER2
XA	4200	4200,4		00	5200,4		5200	YA
XA	4210	4210,4		00	5200,4		5200	YB
XB	4200	4200,4		00	5210,4		5210	YA
XB	4210	4210,4		00	5210,4		5210	YB

### CTC Connection

From CTC or FC CHPID: ESERVER.A3 S FC SHR  
 Route: Point-to-Point  
 From CNC/FCV or FC CHPID: ESERVER2.B3 S FC SHR

#### Details:

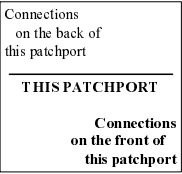
Image on ESERVER	Control Unit	Devices	OS	UA	Devices	OS	Control Unit	Image on ESERVER2
XA	4100	4100,4		00	5100,4		5100	YA
XA	4110	4110,4		00	5100,4		5100	YB
XB	4100	4100,4		00	5110,4		5110	YA
XB	4110	4110,4		00	5110,4		5110	YB

Cabinet Cabinet #1 Low

Cabinet:	Cabinet #1 Low
Model:	Data Switch FMS
Short name:	C1
# Panel spaces:	1

LEGEND

Front View of Patchport



Back View of Patchport



Uninstalled Patchport



## Cabinet C1, Panel 0, 6 by 6, Front View

Patchport Naming Format: "{ Data Switch FMS format }%CABINET%%PANEL/B%%cGROUP%%PORT/1%"

3990-003-240.SC0.A mmf1069 C20A1 Trunk == C10A1 == mmf1024 ESCD_5.80	3990-003-240.SC1.A mmf1067 C20B1 Trunk == C10B1 == mmf1030 ESCD_5.89	3990-006-300.SC0.E mmf1057 C20C1 Trunk == C10C1 == mmf1036 ESCD_5.83	3990-003-360.SC1.E mmf5101 == C10D1 == mmf1046 ESCD_5.98	C20E1 Trunk == C10E1 ==	C20F1 Trunk == C10F1 ==
3990-003-240.SC0.B mmf1070 C20A2 Trunk == C10A2 == mmf1025 ESCD_2.84	3990-003-240.SC1.B mmf1068 C20B2 Trunk == C10B2 == mmf1031 ESCD_2.8D	3990-006-300.SC0.F mmf1058 C20C2 Trunk == C10C2 == mmf1037 ESCD_2.87	C20D2 Trunk == C10D2 ==	C20E2 Trunk == C10E2 ==	C20F2 Trunk == C10F2 ==
3990-003-200.SC1.A mmf1071 C20A3 Trunk == C10A3 == mmf1026 ESCD_5.88	3990-006-280.SC0.E mmf1061 C20B3 Trunk == C10B3 == mmf1032 ESCD_5.82	3990-006-300.SC1.E mmf1059 C20C3 Trunk == C10C3 == mmf1038 ESCD_5.8B	3990-006-380.SC0.E mmf1048 C20D3 Trunk == C10D3 == mmf1040 ESCD_5.91	C20E3 Trunk == C10E3 ==	C20F3 Trunk == C10F3 ==
3990-003-200.SC1.B mmf1072 C20A4 Trunk == C10A4 == mmf1027 ESCD_2.8C	3990-006-280.SC0.F mmf1062 C20B4 Trunk == C10B4 == mmf1033 ESCD_2.86	3990-006-300.SC1.F mmf1060 C20C4 Trunk == C10C4 == mmf1039 ESCD_2.8F	3990-006-380.SC0.F mmf1049 C20D4 Trunk == C10D4 == mmf1041 ESCD_2.95	<del>== C10E4 ==</del>	<del>== C10F4 ==</del>
3990-003-200.SC0.A mmf1065 C20A5 Trunk == C10A5 == mmf1028 ESCD_5.81	3990-006-280.SC1.E mmf1063 C20B5 Trunk == C10B5 == mmf1034 ESCD_5.8A	3990-003-360.SC0.E mmf5001 == C10C5 == mmf1044 ESCD_5.90	3990-006-380.SC1.E mmf1050 C20D5 Trunk == C10D5 == mmf1042 ESCD_5.99	<del>== C10E5 ==</del>	<del>== C10F5 ==</del>
3990-003-200.SC0.B mmf1066 C20A6 Trunk == C10A6 == mmf1029 ESCD_2.85	3990-006-280.SC1.F mmf1064 C20B6 Trunk == C10B6 == mmf1035 ESCD_2.8E	== C10C6 ==	3990-006-380.SC1.F mmf1051 C20D6 Trunk == C10D6 == mmf1043 ESCD_2.9D	<del>== C10E6 ==</del>	<del>== C10F6 ==</del>

## Cabinet C1, Panel 0, 6 by 6, Back View

Patchport Naming Format: "{ Data Switch FMS format }%CABINET%%PANEL/B%%cGROUP%%PORT/1%"

C20F1 Trunk == C10F1 ==	C20E1 Trunk == C10E1 ==	3990-003-360.SC1.E mmf5101 == C10D1 == mmf1046 ESCD_5.98	3990-006-300.SC0.E mmf1057 C20C1 Trunk == C10C1 == mmf1036 ESCD_5.83	3990-003-240.SC1.A mmf1067 C20B1 Trunk == C10B1 == mmf1030 ESCD_5.89	3990-003-240.SC0.A mmf1069 C20A1 Trunk == C10A1 == mmf1024 ESCD_5.80
C20F2 Trunk == C10F2 ==	C20E2 Trunk == C10E2 ==	C20D2 Trunk == C10D2 ==	3990-006-300.SC0.F mmf1058 C20C2 Trunk == C10C2 == mmf1037 ESCD_2.87	3990-003-240.SC1.B mmf1068 C20B2 Trunk == C10B2 == mmf1031 ESCD_2.8D	3990-003-240.SC0.B mmf1070 C20A2 Trunk == C10A2 == mmf1025 ESCD_2.84
C20F3 Trunk == C10F3 ==	C20E3 Trunk == C10E3 ==	3990-006-380.SC0.E mmf1048 C20D3 Trunk == C10D3 == mmf1040 ESCD_5.91	3990-006-300.SC1.E mmf1059 C20C3 Trunk == C10C3 == mmf1038 ESCD_5.8B	3990-006-280.SC0.E mmf1061 C20B3 Trunk == C10B3 == mmf1032 ESCD_5.82	3990-003-200.SC1.A mmf1071 C20A3 Trunk == C10A3 == mmf1026 ESCD_5.88
== C10F4 ==	== C10E4 ==	3990-006-380.SC0.F mmf1049 C20D4 Trunk == C10D4 == mmf1041 ESCD_2.95	3990-006-300.SC1.F mmf1060 C20C4 Trunk == C10C4 == mmf1039 ESCD_2.8F	3990-006-280.SC0.F mmf1062 C20B4 Trunk == C10B4 == mmf1033 ESCD_2.86	3990-003-200.SC1.B mmf1072 C20A4 Trunk == C10A4 == mmf1027 ESCD_2.8C
== C10F5 ==	== C10E5 ==	3990-006-380.SC1.E mmf1050 C20D5 Trunk == C10D5 == mmf1042 ESCD_5.99	3990-003-360.SC0.E mmf5001 == C10C5 == mmf1044 ESCD_5.90	3990-006-280.SC1.E mmf1063 C20B5 Trunk == C10B5 == mmf1034 ESCD_5.8A	3990-003-200.SC0.A mmf1065 C20A5 Trunk == C10A5 == mmf1028 ESCD_5.81
== C10F6 ==	== C10E6 ==	3990-006-380.SC1.F mmf1051 C20D6 Trunk == C10D6 == mmf1043 ESCD_2.9D	== C10C6 ==	3990-006-280.SC1.F mmf1064 C20B6 Trunk == C10B6 == mmf1035 ESCD_2.8E	3990-003-200.SC0.B mmf1066 C20A6 Trunk == C10A6 == mmf1029 ESCD_2.85

## Fiber Link Report (CHPID Section)

Tx (dB)	Rx (dB)	Composition
n/a	n/a	BOESYS 20 -jumper- 3745-61A.F
n/a	n/a	BOESYS 21 -jumper- 3990-006-600 SC0.A
n/a	n/a	BOESYS 22 -jumper- 3990-006-600 SC1.A
n/a	n/a	BOESYS 23 -jumper- 3990-006-600 SC0.B
n/a	n/a	BOESYS 24 -jumper- 3990-006-600 SC1.B
n/a	n/a	BOESYS 25 -mmfl080- SWCH_5.A9
n/a	n/a	BOESYS 26 -mmfl078- SWCH_5.A2
n/a	n/a	BOESYS 27 -mmfl079- SWCH_5.A6
n/a	n/a	BOESYS 28 -mmfl081- SWCH_5.AA
n/a	n/a	BOESYS 29 -jumper- SWCH_5.AB
n/a	n/a	BOESYS 66 -jumper- BOESYS 61
n/a	n/a	POKRUN 00 -jumper- SWCH_2.80
n/a	n/a	POKRUN 01 -jumper- SWCH_2.81
n/a	n/a	POKRUN 02 -jumper- SWCH_2.82
n/a	n/a	POKRUN 03 -jumper- SWCH_2.83
n/a	n/a	POKRUN 04 -jumper- SWCH_2.88
n/a	n/a	POKRUN 05 -jumper- SWCH_2.89
n/a	n/a	POKRUN 06 -jumper- SWCH_2.8A
n/a	n/a	ESERVER A0 -jumper- SWCH_40.A0
n/a	n/a	ESERVER A1 -jumper- SWCH_40.A1
n/a	n/a	ESERVER A2 -jumper- SWCH_40.A2
n/a	n/a	ESERVER2 B0 -jumper- SWCH_40.B0
n/a	n/a	ESERVER2 B1 -jumper- SWCH_40.B1
n/a	n/a	ESERVER2 B2 -jumper- SWCH_40.B2
n/a	n/a	ESERVER2 B3 -jumper- ESERVER A3

## Fiber Link Report (Switch Section)

**Tx (dB) Rx (dB) Composition**

n/a	n/a	SWCH_2.80	-jumper-	POKRUN.00				
n/a	n/a	SWCH_2.81	-jumper-	POKRUN.01				
n/a	n/a	SWCH_2.82	-jumper-	POKRUN.02				
n/a	n/a	SWCH_2.83	-jumper-	POKRUN.03				
n/a	n/a	SWCH_2.84	-mmf1025-	C10A2	-trunk-	C20A2	-mmf1070-	3990-003-240.SC0.B
n/a	n/a	SWCH_2.85	-mmf1029-	C10A6	-trunk-	C20A6	-mmf1066-	3990-003-200.SC0.B
n/a	n/a	SWCH_2.86	-mmf1033-	C10B4	-trunk-	C20B4	-mmf1062-	3990-006-280.SC0.F
n/a	n/a	SWCH_2.87	-mmf1037-	C10C2	-trunk-	C20C2	-mmf1058-	3990-006-300.SC0.F
n/a	n/a	SWCH_2.88	-jumper-	POKRUN.04				
n/a	n/a	SWCH_2.89	-jumper-	POKRUN.05				
n/a	n/a	SWCH_2.8A	-jumper-	POKRUN.06				
n/a	n/a	SWCH_2.8C	-mmf1027-	C10A4	-trunk-	C20A4	-mmf1072-	3990-003-200.SC1.B
n/a	n/a	SWCH_2.8D	-mmf1031-	C10B2	-trunk-	C20B2	-mmf1068-	3990-003-240.SC1.B
n/a	n/a	SWCH_2.8E	-mmf1035-	C10B6	-trunk-	C20B6	-mmf1064-	3990-006-280.SC1.F
n/a	n/a	SWCH_2.8F	-mmf1039-	C10C4	-trunk-	C20C4	-mmf1060-	3990-006-300.SC1.F
n/a	n/a	SWCH_2.94	-mmf1045-	C10C6	-jumper-			3990-003-360.SC0.F
n/a	n/a	SWCH_2.95	-mmf1041-	C10D4	-trunk-	C20D4	-mmf1049-	3990-006-380.SC0.F
n/a	n/a	SWCH_2.9C	-jumper-	3990-003-360.SC1.F				
n/a	n/a	SWCH_2.9D	-mmf1043-	C10D6	-trunk-	C20D6	-mmf1051-	3990-006-380.SC1.F
n/a	n/a	SWCH_5.04	-jumper-	3990-006-380.SC0.G				
n/a	n/a	SWCH_5.05	-jumper-	3990-006-380.SC1.G				
n/a	n/a	SWCH_5.80	-mmf1024-	C10A1	-trunk-	C20A1	-mmf1069-	3990-003-240.SC0.A
n/a	n/a	SWCH_5.81	-mmf1028-	C10A5	-trunk-	C20A5	-mmf1065-	3990-003-200.SC0.A
n/a	n/a	SWCH_5.82	-mmf1032-	C10B3	-trunk-	C20B3	-mmf1061-	3990-006-280.SC0.E
n/a	n/a	SWCH_5.83	-mmf1036-	C10C1	-trunk-	C20C1	-mmf1057-	3990-006-300.SC0.E
n/a	n/a	SWCH_5.84	-jumper-	S->P				
n/a	n/a	SWCH_5.88	-mmf1026-	C10A3	-trunk-	C20A3	-mmf1071-	3990-003-200.SC1.A
n/a	n/a	SWCH_5.89	-mmf1030-	C10B1	-trunk-	C20B1	-mmf1067-	3990-003-240.SC1.A
n/a	n/a	SWCH_5.8A	-mmf1034-	C10B5	-trunk-	C20B5	-mmf1063-	3990-006-280.SC1.E
n/a	n/a	SWCH_5.8B	-mmf1038-	C10C3	-trunk-	C20C3	-mmf1059-	3990-006-300.SC1.E
n/a	n/a	SWCH_5.90	-mmf1044-	C10C5	-trunk-	C20C5	-mmf1052-	3990-003-360.SC0.E
n/a	n/a	SWCH_5.91	-mmf1040-	C10D3	-trunk-	C20D3	-mmf1048-	3990-006-380.SC0.E
n/a	n/a	SWCH_5.98	-mmf1046-	C10D1	-jumper-			3990-003-360.SC1.E
n/a	n/a	SWCH_5.99	-mmf1042-	C10D5	-trunk-	C20D5	-mmf1050-	3990-006-380.SC1.E
n/a	n/a	SWCH_5.A2	-mmf1078-	BOESYS.26				
n/a	n/a	SWCH_5.A6	-mmf1079-	BOESYS.27				
n/a	n/a	SWCH_5.A9	-mmf1080-	BOESYS.25				
n/a	n/a	SWCH_5.AA	-mmf1081-	BOESYS.28				
n/a	n/a	SWCH_5.AB	-jumper-	BOESYS.29				
n/a	n/a	SWCH_40.A0	-jumper-	ESERVER.A0				
n/a	n/a	SWCH_40.A1	-jumper-	ESERVER.A1				
n/a	n/a	SWCH_40.A2	-jumper-	ESERVER.A2				
n/a	n/a	SWCH_40.B0	-jumper-	ESERVER2.B0				
n/a	n/a	SWCH_40.B1	-jumper-	ESERVER2.B1				
n/a	n/a	SWCH_40.B2	-jumper-	ESERVER2.B2				

n/a	n/a	3745-61A F	-jumper-	BOESYS 20									
n/a	n/a	3990-003-200 SC0 A	-mmf1065-	C20A5	-trunk-	C10A5	-mmf1028-	SWCH_5 81					
n/a	n/a	3990-003-200 SC0 B	-mmf1066-	C20A6	-trunk-	C10A6	-mmf1029-	SWCH_2 85					
n/a	n/a	3990-003-200 SC1 A	-mmf1071-	C20A3	-trunk-	C10A3	-mmf1026-	SWCH_5 88					
n/a	n/a	3990-003-200 SC1 B	-mmf1072-	C20A4	-trunk-	C10A4	-mmf1027-	SWCH_2 8C					
n/a	n/a	3990-003-240 SC0 A	-mmf1069-	C20A1	-trunk-	C10A1	-mmf1024-	SWCH_5 80					
n/a	n/a	3990-003-240 SC0 B	-mmf1070-	C20A2	-trunk-	C10A2	-mmf1025-	SWCH_2 84					
n/a	n/a	3990-003-240 SC1 A	-mmf1067-	C20B1	-trunk-	C10B1	-mmf1030-	SWCH_5 89					
n/a	n/a	3990-003-240 SC1 B	-mmf1068-	C20B2	-trunk-	C10B2	-mmf1031-	SWCH_2 8D					
n/a	n/a	3990-003-360 SC0 E	-mmf1052-	C20C5	-trunk-	C10C5	-mmf1044-	SWCH_5 90					
n/a	n/a	3990-003-360 SC0 F	-jumper-	C10C6	-mmf1045-			SWCH_2 94					
n/a	n/a	3990-003-360 SC1 E	-jumper-	C10D1	-mmf1046-			SWCH_5 98					
n/a	n/a	3990-003-360 SC1 F	-jumper-					SWCH_2 9C					
n/a	n/a	3990-006-280 SC0 E	-mmf1061-	C20B3	-trunk-	C10B3	-mmf1032-	SWCH_5 82					
n/a	n/a	3990-006-280 SC0 F	-mmf1062-	C20B4	-trunk-	C10B4	-mmf1033-	SWCH_2 86					
n/a	n/a	3990-006-280 SC1 E	-mmf1063-	C20B5	-trunk-	C10B5	-mmf1034-	SWCH_5 8A					
n/a	n/a	3990-006-280 SC1 F	-mmf1064-	C20B6	-trunk-	C10B6	-mmf1035-	SWCH_2 8E					
n/a	n/a	3990-006-300 SC0 E	-mmf1057-	C20C1	-trunk-	C10C1	-mmf1036-	SWCH_5 83					
n/a	n/a	3990-006-300 SC0 F	-mmf1058-	C20C2	-trunk-	C10C2	-mmf1037-	SWCH_2 87					
n/a	n/a	3990-006-300 SC1 E	-mmf1059-	C20C3	-trunk-	C10C3	-mmf1038-	SWCH_5 8B					
n/a	n/a	3990-006-300 SC1 F	-mmf1060-	C20C4	-trunk-	C10C4	-mmf1039-	SWCH_2 8F					
n/a	n/a	3990-006-380 SC0 E	-mmf1048-	C20D3	-trunk-	C10D3	-mmf1040-	SWCH_5 91					
n/a	n/a	3990-006-380 SC0 F	-mmf1049-	C20D4	-trunk-	C10D4	-mmf1041-	SWCH_2 95					
n/a	n/a	3990-006-380 SC0 G	-jumper-					SWCH_5 04					
n/a	n/a	3990-006-380 SC1 E	-mmf1050-	C20D5	-trunk-	C10D5	-mmf1042-	SWCH_5 99					
n/a	n/a	3990-006-380 SC1 F	-mmf1051-	C20D6	-trunk-	C10D6	-mmf1043-	SWCH_2 9D					
n/a	n/a	3990-006-380 SC1 G	-jumper-					SWCH_5 05					
n/a	n/a	3990-006-600 SC0 A	-jumper-	BOESYS 21									
n/a	n/a	3990-006-600 SC0 B	-jumper-	BOESYS 23									
n/a	n/a	3990-006-600 SC1 A	-jumper-	BOESYS 22									
n/a	n/a	3990-006-600 SC1 B	-jumper-	BOESYS 24									

Fiber Link Report (Converter Section)

Tx (dB)	Rx (dB)	Composition
n/a	n/a	S->P -jumper- SWCH_5.84

## 3990-003-360 SN:35563

SN:35563

Asset Mgmt #: 8337539-77835  
Location: Main Complex  
Usage: Databases

### 3990-003-360.SC0

#### Control Units:

<b>0340</b>	<b>3990-3</b>	<b>SN:35563</b>
Devices:	340,64	
BOESYS:	CHPIDs: 25,28	
POKRUN:	CHPIDs: 00	

#### Channel Interfaces:

<b>SC0.A P</b>	No connection			
<b>SC0.B P</b>	No connection			
<b>SC0.C P</b>	No connection			
<b>SC0.D P</b>	No connection			
<b>SC0.E S</b>	<b>ESCD_5.90</b>			
	In: via C10C5	mmf5001	75	MM Jumper
	on ESCD_5.90	mmf1044	60	MM Jumper
<b>SC0.F S</b>	<b>ESCD_2.94</b>			
	In: on ESCD_2.94	mmf5002	75	MM Jumper

#### Device Interfaces:

<b>SC0.SP0</b>	<b>A in String 0360-037F</b>	mmf4001	50	Blue Full
	<b>A in String 340-35F</b>			
<b>SC0.SP1</b>	<b>B in String 0360-037F</b>	mmf4002	50	Blue Full
	<b>B in String 340-35F</b>			

### 3990-003-360.SC1

#### Control Units:

<b>0341</b>	<b>3990-3</b>	<b>SN:35563</b>
Devices:	340,64	
BOESYS:	CHPIDs: 26	
POKRUN:	CHPIDs: 01	

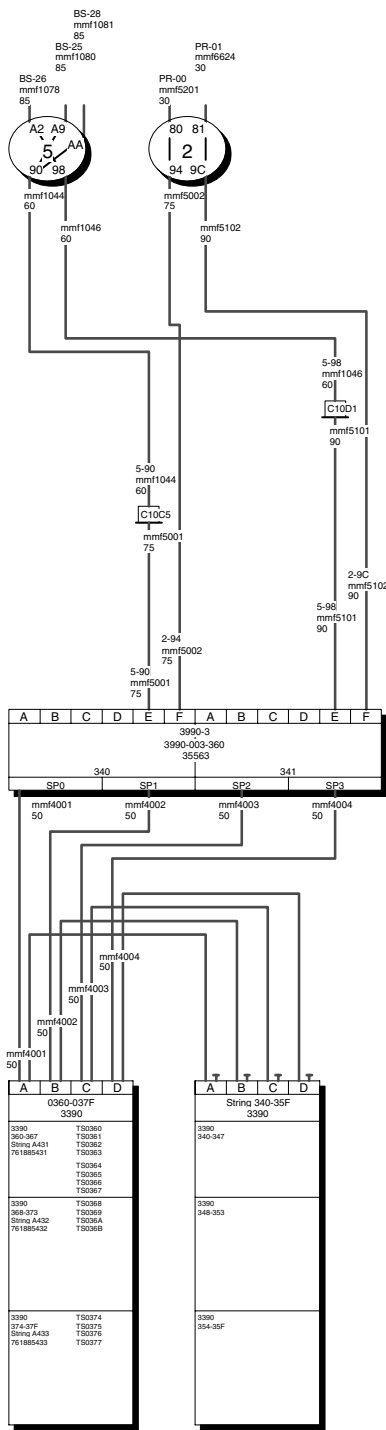
#### Channel Interfaces:

<b>SC1.A P</b>	No connection			
<b>SC1.B P</b>	No connection			
<b>SC1.C P</b>	No connection			
<b>SC1.D P</b>	No connection			
<b>SC1.E S</b>	<b>ESCD_5.98</b>			
	In: via C10D1	mmf5101	90	MM Jumper
	on ESCD_5.98	mmf1046	60	MM Jumper
<b>SC1.F S</b>	<b>ESCD_2.9C</b>			
	In: on ESCD_2.9C	mmf5102	90	MM Jumper

#### Device Interfaces:

<b>SC1.SP2</b>	<b>C in String 0360-037F</b>	mmf4003	50	Blue Full
	<b>C in String 340-35F</b>			
<b>SC1.SP3</b>	<b>D in String 0360-037F</b>	mmf4004	50	Blue Full
	<b>D in String 340-35F</b>			

3990-003-360



## String 0360-037F SN:761885431

SN:761885431

Asset Mgmt #: 8337539-77835  
Location: Main complex  
Usage: Databases

### Devices:

BOESYS, POKRUN  
Control Units: 0340 0341  
360,32 3390 SN:761885431 "Dev.Nr. 0360"

### String Interfaces:

<b>A</b>	In:	3990-003-360.SC0.SP0	mmf4001	50	Blue Full
	Out:	String 340-35F.A			
<b>B</b>	In:	3990-003-360.SC0.SP1	mmf4002	50	Blue Full
	Out:	String 340-35F.B			
<b>C</b>	In:	3990-003-360.SC1.SP2	mmf4003	50	Blue Full
	Out:	String 340-35F.C			
<b>D</b>	In:	3990-003-360.SC1.SP3	mmf4004	50	Blue Full
	Out:	String 340-35F.D			

### Units:

String A431  
SN:761885431  
Asset Mgmt #: 8337539-77835  
Location: Main Complex  
Usage: Databases

360 TS0360	361 TS0361	362 TS0362	363 TS0363	364 TS0364
365 TS0365	366 TS0366	367 TS0367		

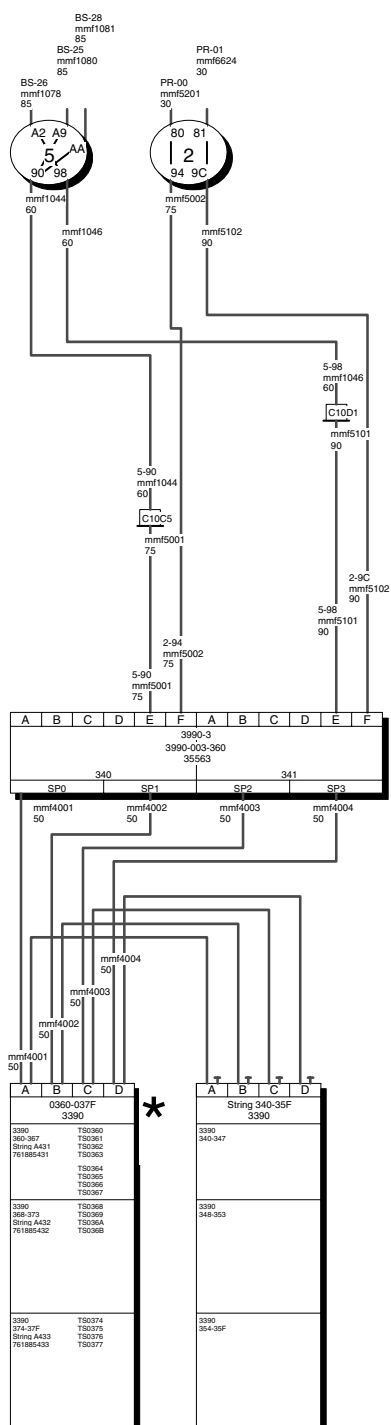
String A432  
SN:761885432  
Asset Mgmt #: 8337539-77835  
Location: Main Complex  
Usage: Databases

368 TS0368	369 TS0369	36A TS036A	36B TS036B	36C,8
------------	------------	------------	------------	-------

String A433  
SN:761885433  
Asset Mgmt #: 8337539-77835  
Location: Main Complex  
Usage: Databases

374 TS0374	375 TS0375	376 TS0376	377 TS0377	378,8
------------	------------	------------	------------	-------

String 0360-037F



## Crossbar #1 [X1]

SN:7743298543543254

Asset Mgmt #: 8337539-77835

Location: Main complex

### Normal / Default configuration:

Weekday

### Configurations:

Weekday

Weekend

### Channel interfaces:

#### 1 POKRUN.09

In: on POKRUN.09

Out: Terminated

mmf9945 30 Blue Full

#### 2 BOESYS.35

In: on BOESYS.35

Out: to 6262 #1.A

mmf9946 30 Blue Full

mmf9947 150 Blue Full

#### 3 POKRUN.0A

In: on POKRUN.0A

Out: Terminated

mmf9948 40 Blue Full

#### 4 No connection

### Control Unit Interfaces:

#### A1 A in 6262 #2 Not connected

mmf9950 75 Blue Full

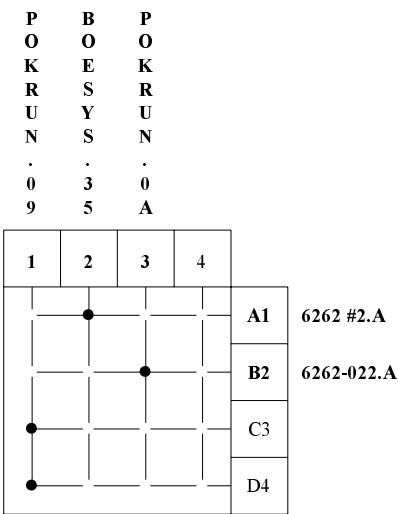
#### B2 A in 6262-022 reaching String 000F

mmf9954 75 Blue Full

#### C3 No connection

#### D4 No connection

Crossbar #1 configuration: Weekday



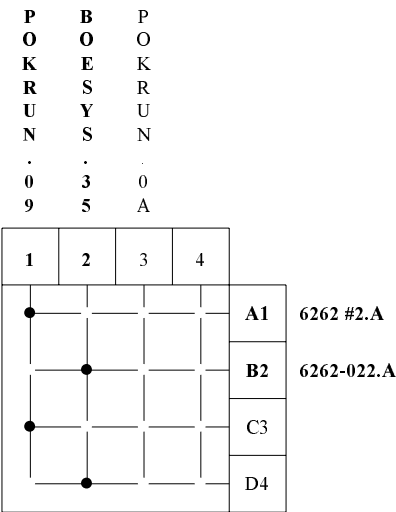
Channel Interfaces in use:

1	POKRUN.09	C3	No connection
		D4	No connection
2	BOESYS.35	A1	A in 6262 #2 Not connected
3	POKRUN.0A	B2	A in 6262-022 reaching String 000F

Control Unit Interfaces in use:

A1	A in 6262 #2 Not connected
2	BOESYS.35
B2	A in 6262-022 reaching String 000F
3	POKRUN.0A

Crossbar #1 configuration: Weekend



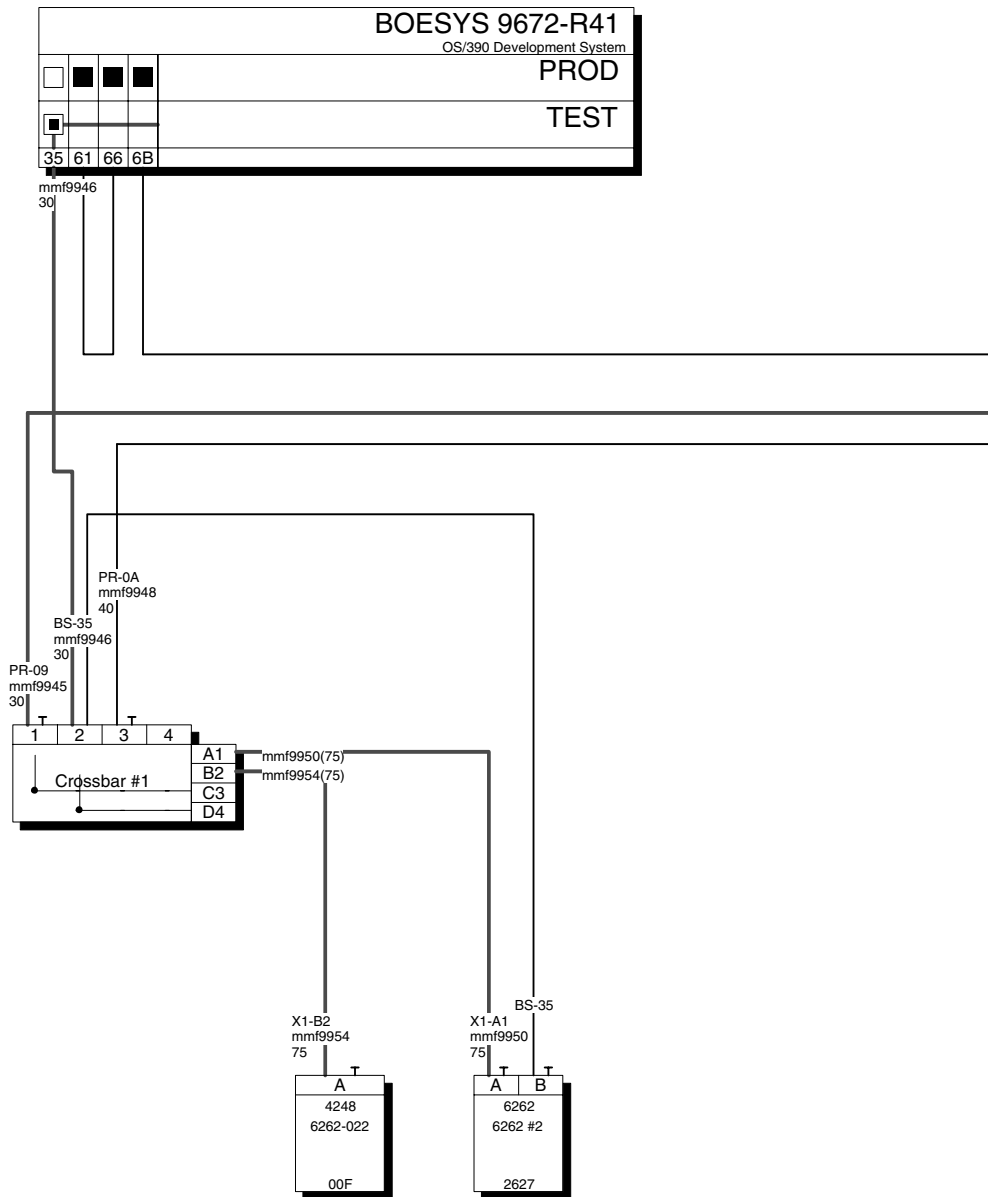
Channel Interfaces in use:

1	POKRUN.09	A1	A in 6262 #2 Not connected
		C3	No connection
2	BOESYS.35	B2	A in 6262-022 reaching String 000F
		D4	No connection

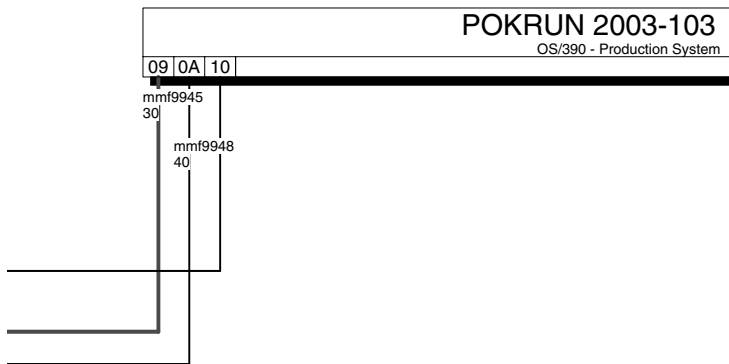
Control Unit Interfaces in use:

A1	A in 6262 #2 Not connected
1	POKRUN.09
B2	A in 6262-022 reaching String 000F
2	BOESYS.35

## Crossbar #1 (1 of 2)



## Crossbar #1 (2 of 2)



## ESCD\_5

Model: 9032-5  
Used for FC-Bridge card  
SN:8430954328  
Asset Mgmt #: 8337539-77835

**Control Unit:**  
5442 9032-5 SN:8430954328 "Used for FC-Bridge card"  
Devices: 5442,1  
BOESYS: CHPIDs: 25

**Device:**  
BOESYS  
Control Units: 5442  
5442,1 9032-5 SN:8430954328 "Used for FC-Bridge card"

### PORTS ON THE PROCESSOR SIDE:

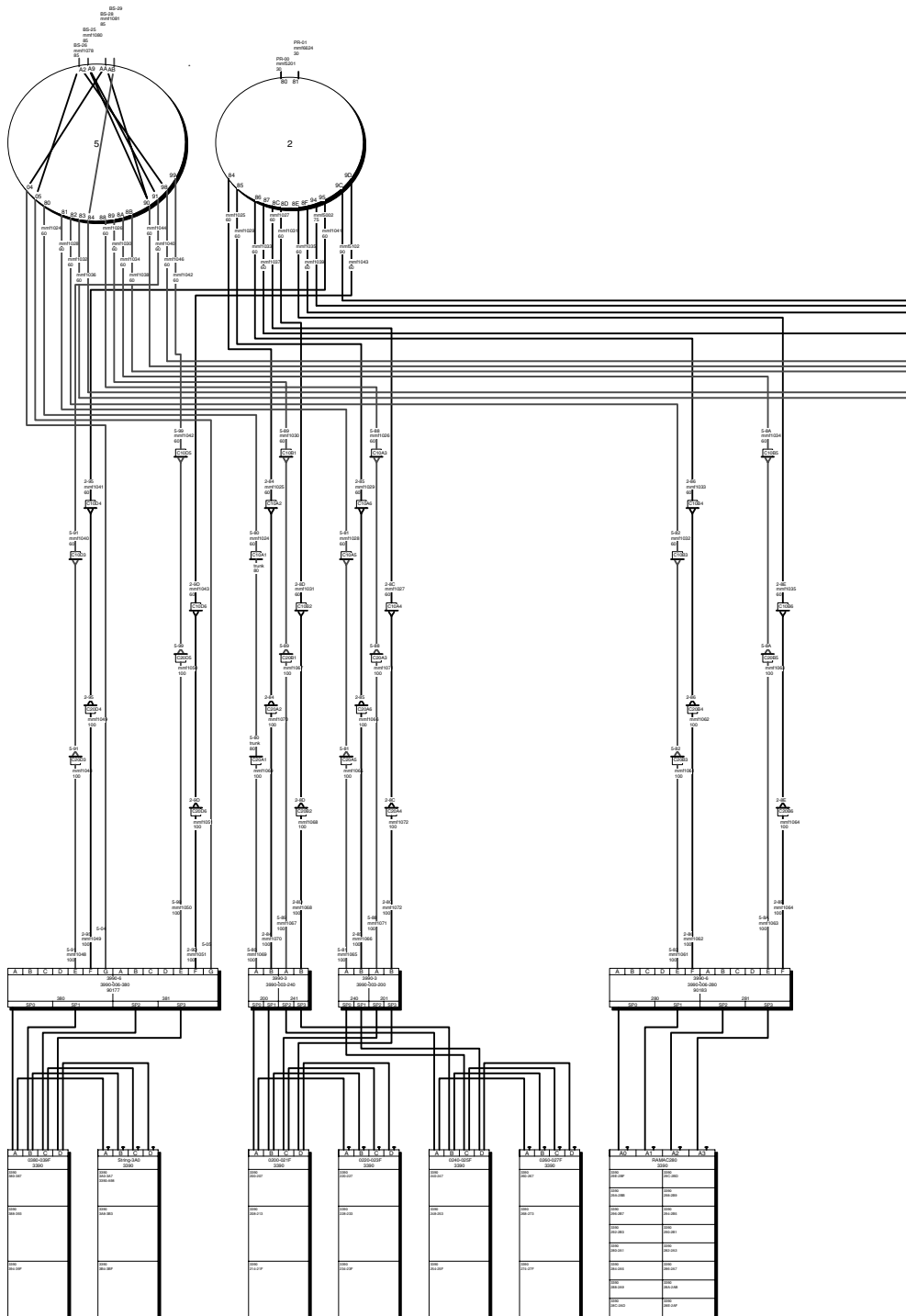
<b>A2 LED</b>	<b>on BOESYS.26</b>	mmf1078	85	MM Jumper
<b>A6 LED</b>	<b>on BOESYS.27</b>	mmf1079	85	MM Jumper
<b>A9 LED</b>	<b>on BOESYS.25</b>	mmf1080	85	MM Jumper
<b>AA LED</b>	<b>on BOESYS.28</b>	mmf1081	85	MM Jumper
<b>AB LED</b>	<b>on BOESYS.29</b>			

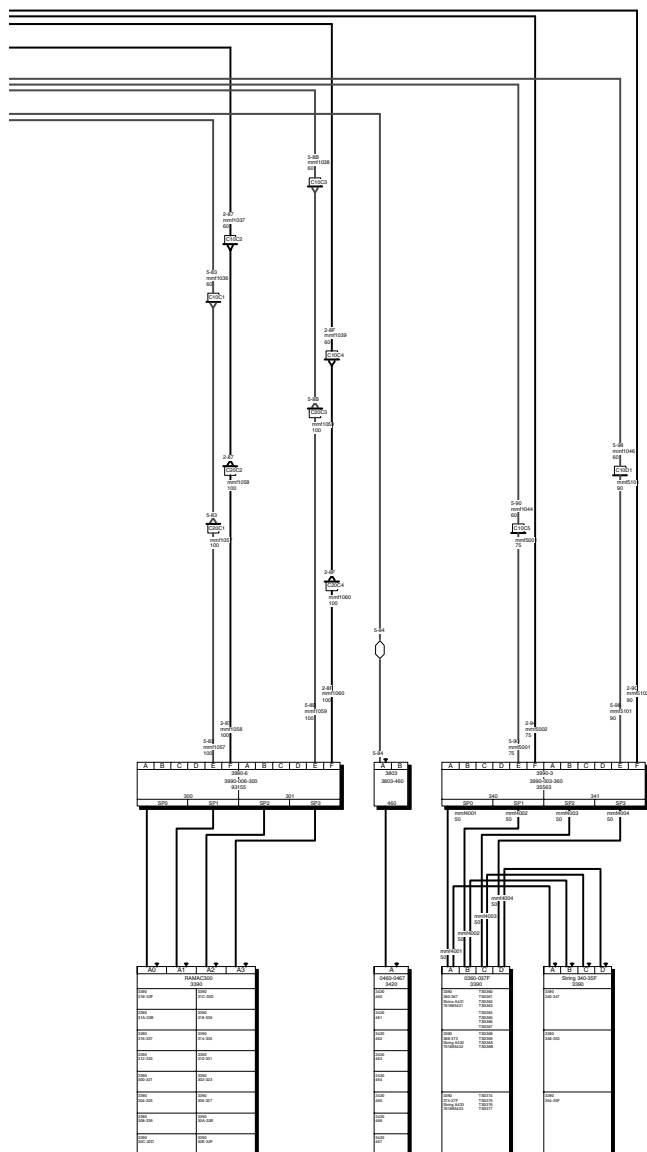
### PORTS ON THE CONTROL UNIT SIDE:

<b>04 LED</b>	<b>to SC0.G in 3990-006-380</b> <b>reaching String 0380-039F String-3A0</b>			
<b>05 LED</b>	<b>to SC1.G in 3990-006-380</b> <b>reaching String 0380-039F String-3A0</b>			
<b>80 LED</b>	via C10A1 via C20A1 <b>to SC0.A in 3990-003-240 reaching String 0200-021F String 0220-02</b>	mmf1024 trunk mmf1069	60 80 100	MM Jumper MM Jumper MM Jumper
<b>81 LED</b>	via C10A5 via C20A5 <b>to SC0.A in 3990-003-200 reaching String 0240-025F String 0260-02</b>	mmf1028 mmf1065	60 100	MM Jumper MM Jumper
<b>82 LED</b>	via C10B3 via C20B3 <b>to SC0.E in 3990-006-280 reaching RAMAC280</b>	mmf1032 mmf1061	60 100	MM Jumper MM Jumper
<b>83 LED</b>	via C10C1 via C20C1 <b>to SC0.E in 3990-006-300 reaching RAMAC300</b>	mmf1036 mmf1057	60 100	MM Jumper MM Jumper
<b>84 LED</b>	via S->P <b>to A in 3803-460 reaching String 0460-0467</b>			
<b>88 LED</b>	via C10A3 via C20A3 <b>to SC1.A in 3990-003-200 reaching String 0240-025F String 0260-02</b>	mmf1026 mmf1071	60 100	MM Jumper MM Jumper
<b>89 LED</b>	via C10B1 via C20B1 <b>to SC1.A in 3990-003-240 reaching String 0200-021F String 0220-02</b>	mmf1030 mmf1067	60 100	MM Jumper MM Jumper

<b>8A LED</b>	via C10B5	mmfl034	60	MM Jumper
	via C20B5 to SC1.E in 3990-006-280 reaching RAMAC280	mmfl063	100	MM Jumper
<b>8B LED</b>	via C10C3	mmfl038	60	MM Jumper
	via C20C3 to SC1.E in 3990-006-300 reaching RAMAC300	mmfl059	100	MM Jumper
<b>90 LED</b>	via C10C5	mmfl044	60	MM Jumper
	to SC0.E in 3990-003-360 reaching String 0360-037F String 340-35F	mmf5001	75	MM Jumper
<b>91 LED</b>	via C10D3	mmfl040	60	MM Jumper
	via C20D3 to SC0.E in 3990-006-380 reaching String 0380-039F String-3A0	mmfl048	100	MM Jumper
<b>98 LED</b>	via C10D1	mmfl046	60	MM Jumper
	to SC1.E in 3990-003-360 reaching String 0360-037F String 340-35F	mmf5101	90	MM Jumper
<b>99 LED</b>	via C10D5	mmfl042	60	MM Jumper
	via C20D5 to SC1.E in 3990-006-380 reaching String 0380-039F String-3A0	mmfl050	100	MM Jumper
<b>FE (internal)</b>	to A in 9032 #5 reaching String 5442			

# ESCD\_5 (1 of 2)





## Cables

From	ID	Len	Type	Page #	To	db Loss A & B	
ESCD_5 80	mmf1024	60	MM Jumper		C10A1	n/a	n/a
ESCD_5 88	mmf1026	60	MM Jumper		C10A3	n/a	n/a
ESCD_5 81	mmf1028	60	MM Jumper		C10A5	n/a	n/a
ESCD_5 89	mmf1030	60	MM Jumper		C10B1	n/a	n/a
ESCD_5 82	mmf1032	60	MM Jumper		C10B3	n/a	n/a
ESCD_5 8A	mmf1034	60	MM Jumper		C10B5	n/a	n/a
ESCD_5 83	mmf1036	60	MM Jumper		C10C1	n/a	n/a
ESCD_5 8B	mmf1038	60	MM Jumper		C10C3	n/a	n/a
ESCD_5 91	mmf1040	60	MM Jumper		C10D3	n/a	n/a
ESCD_5 99	mmf1042	60	MM Jumper		C10D5	n/a	n/a
ESCD_5 90	mmf1044	60	MM Jumper		C10C5	n/a	n/a
ESCD_5 98	mmf1046	60	MM Jumper		C10D1	n/a	n/a
C20D3	mmf1048	100	MM Jumper		3990-006-380. SC0. E	n/a	n/a
C20D5	mmf1050	100	MM Jumper		3990-006-380. SC1. E	n/a	n/a
C20C1	mmf1057	100	MM Jumper		3990-006-300. SC0. E	n/a	n/a
C20C3	mmf1059	100	MM Jumper		3990-006-300. SC1. E	n/a	n/a
C20B3	mmf1061	100	MM Jumper		3990-006-280. SC0. E	n/a	n/a
C20B5	mmf1063	100	MM Jumper		3990-006-280. SC1. E	n/a	n/a
C20A5	mmf1065	100	MM Jumper		3990-003-200. SC0. A	n/a	n/a
C20B1	mmf1067	100	MM Jumper		3990-003-240. SC1. A	n/a	n/a
C20A1	mmf1069	100	MM Jumper		3990-003-240. SC0. A	n/a	n/a
C20A3	mmf1071	100	MM Jumper		3990-003-200. SC1. A	n/a	n/a
BOESYS 26	mmf1078	85	MM Jumper		ESCD_5 A2	n/a	n/a
BOESYS 27	mmf1079	85	MM Jumper		ESCD_5 A6	n/a	n/a
BOESYS 25	mmf1080	85	MM Jumper		ESCD_5 A9	n/a	n/a
BOESYS 28	mmf1081	85	MM Jumper		ESCD_5 AA	n/a	n/a
3990-003-360. SC0. SP0	mmf4001	50	Blue Full		String 0360-037F. A		
3990-003-360. SC0. SP1	mmf4002	50	Blue Full		String 0360-037F. B		
3990-003-360. SC1. SP2	mmf4003	50	Blue Full		String 0360-037F. C		
3990-003-360. SC1. SP3	mmf4004	50	Blue Full		String 0360-037F. D		
C10C5	mmf5001	75	MM Jumper		3990-003-360. SC0. E	n/a	n/a
C10D1	mmf5101	90	MM Jumper		3990-003-360. SC1. E	n/a	n/a
C10A1	trunk	80	MM Jumper		C20A1	n/a	n/a

---

## Sample Cable Labels

The following is a sample of cable labels as printed on a printable label form.

<b>EMIFSYS.51</b> ESCD_1.FA 1995-07-17   MMF1013	<b>ESCD_1.FA</b> EMIFSYS.51 1995-07-17   MMF1013	<b>EMIFSYS.50</b> ESCD_1.FB 1995-07-17   MMF1012	<b>ESCD_1.FB</b> EMIFSYS.50 1995-07-17   MMF1012	<b>EMIFSYS.49</b> ESCD_2.EF 1995-07-17   MMF1011	<b>ESCD_2.EF</b> EMIFSYS.49 1995-07-17   MMF1011	<b>EMIFSYS.48</b> ESCD_2.F0 1995-07-17   MMF1010
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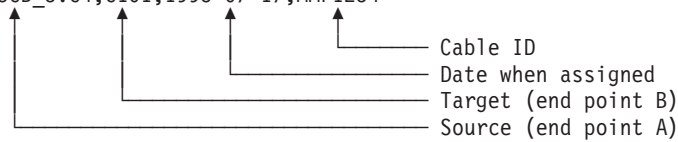
<b>ESCD_2.F0</b> EMIFSYS.48 1995-07-17   MMF1010	<b>EMIFSYS.47</b> ESCD_2.F1 1995-07-17   MMF1009	<b>ESCD_2.F1</b> EMIFSYS.47 1995-07-17   MMF1009	<b>EMIFSYS.46</b> ESCD_2.F2 1995-07-17   MMF1008	<b>ESCD_2.F2</b> EMIFSYS.46 1995-07-17   MMF1008	<b>EMIFSYS.45</b> ESCD_2.F3 1995-07-17   MMF1007	<b>ESCD_2.F3</b> EMIFSYS.45 1995-07-17   MMF1007
--	--	--	--	--	--	--

<b>EMIFSYS.44</b> ESCD_2.F4 1995-07-17   MMF1006	<b>ESCD_2.F4</b> EMIFSYS.44 1995-07-17   MMF1006	<b>EMIFSYS.43</b> ESCD_2.F5 1995-07-17   MMF1006	<b>ESCD_2.F5</b> EMIFSYS.43 1995-07-17   MMF1006	<b>EMIFSYS.42</b> ESCD_2.F6 1995-07-17   MMF1005	<b>ESCD_2.F6</b> EMIFSYS.42 1995-07-17   MMF1005	<b>EMIFSYS.41</b> ESCD_2.F7 1995-07-17   MMF1004
--	--	--	--	--	--	--

<b>ESCD_2.F7</b> EMIFSYS.41 1995-07-17   MMF1004	<b>EMIFSYS.40</b> ESCD_2.F8 1995-07-17   MMF1003	<b>ESCD_2.F8</b> EMIFSYS.40 1995-07-17   MMF1003	<b>C101</b> ESCD_3.C4 1995-07-17   MMF1234	<b>ESCD_3.C4</b> C101 1995-07-17   MMF1234
--	--	--	--	--

The following is a sample of cable labels as saved in a comma delimited ASCII file.

```
EMIFSYS.51,ESCD_1.FA,1995-07-17,MMF1013
ESCD_1.FA,EMIFSYS.51,1995-07-17,MMF1013
EMIFSYS.50,ESCD_1.FB,1995-07-17,MMF1012
ESCD_1.FB,EMIFSYS.50,1995-07-17,MMF1012
EMIFSYS.49,ESCD_2.EF,1995-07-17,MMF1011
ESCD_2.EF,EMIFSYS.49,1995-07-17,MMF1011
EMIFSYS.48,ESCD_2.F0,1995-07-17,MMF1010
ESCD_2.F0,EMIFSYS.48,1995-07-17,MMF1010
EMIFSYS.47,ESCD_2.F1,1995-07-17,MMF1009
ESCD_2.F1,EMIFSYS.47,1995-07-17,MMF1009
EMIFSYS.46,ESCD_2.F2,1995-07-17,MMF1008
ESCD_2.F2,EMIFSYS.46,1995-07-17,MMF1008
EMIFSYS.45,ESCD_2.F3,1995-07-17,MMF1007
ESCD_2.F3,EMIFSYS.45,1995-07-17,MMF1007
EMIFSYS.44,ESCD_2.F4,1995-07-17,MMF1006
ESCD_2.F4,EMIFSYS.44,1995-07-17,MMF1006
EMIFSYS.43,ESCD_2.F5,1995-07-17,MMF10066
ESCD_2.F5,EMIFSYS.43,1995-07-17,MMF10066
EMIFSYS.42,ESCD_2.F6,1995-07-17,MMF1005
ESCD_2.F6,EMIFSYS.42,1995-07-17,MMF1005
EMIFSYS.41,ESCD_2.F7,1995-07-17,MMF1004
ESCD_2.F7,EMIFSYS.41,1995-07-17,MMF1004
EMIFSYS.40,ESCD_2.F8,1995-07-17,MMF1003
ESCD_2.F8,EMIFSYS.40,1995-07-17,MMF1003
C101,ESCD_3.C4,1995-07-17,MMF1234
ESCD_3.C4,C101,1995-07-17,MMF1234
```





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## Chapter 13. Scenarios

The scenarios in this chapter have been designed to represent typical procedures that you would go through in the course of maintaining your configuration. They cover the following tasks:

- “Scenario I – Adding and Connecting New Equipment”
- “Scenario II – Defining a CTC Connection” on page 248
- “Scenario III – Defining a Fiber Cabling Infrastructure” on page 259
- “Scenario IV – Configuration Changes for Installing a FICON Bridge Card in a 9032-5 ESCON Director” on page 268
- “Scenario V – Establish a PPRC Connection consisting of several PPRC Links” on page 274

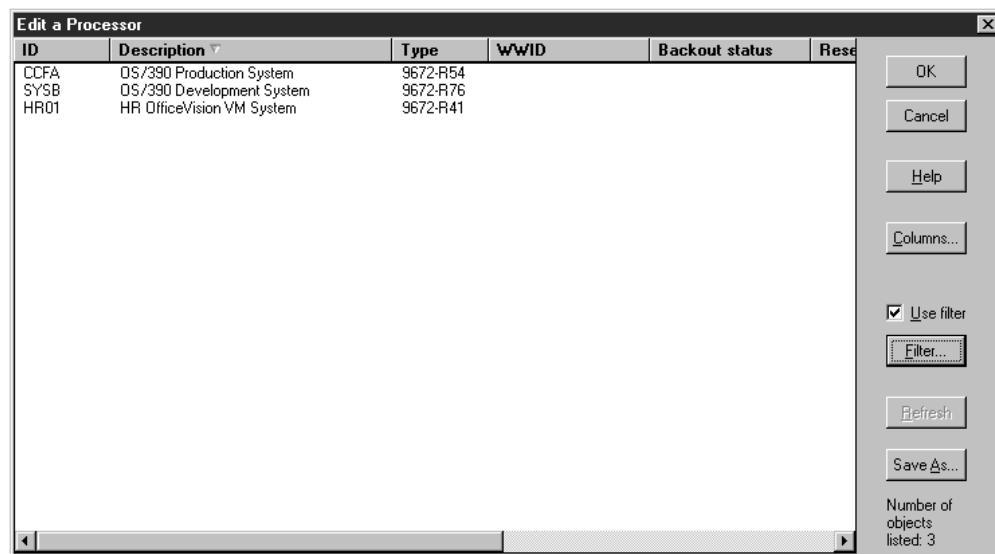
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### Scenario I – Adding and Connecting New Equipment

In this scenario we will create new CHPIDs and strings for a processor with two partitions and connect them to each other through a new controller, a new ESCON switch, and a patchport cabinet. An operation system configuration already exists.

#### Add Four New Channels to an Existing LPAR Processor

1. Edit the processor by selecting **Edit:Processor**. This opens the **Edit a Processor** dialog.



2. Choose the processor from the list (in our example, **SYSB**) and press **OK** or double-click on the processor in the list. This opens the **Processor** dialog.

**Processor**

ID: SYSB Short name: SY [Partitions...](#)

System Name: [CHPIDs...](#)

Description: OS/390 Development System

Serial No.: 0000019672 [Edit...](#)

Type: 9672

Model: R76 [Status...](#)

Mode: LPAR

Support Level: FCV, OSD, OSE, IC, ICB, CF, OSA, ESCON, Parallel

[OK](#)

[Cancel](#)

[Help](#)

SNA address (S/390 microprocessor cluster)

Network name:

CPC name:

3. Click **CHPIDs...** This opens the **CHPIDs** dialog.

**CHPIDs**

Select set of chpids to modify.

ID	Interface type	Type	Mode
65	S	CNC	SHR
66	S	CNC	SHR
67	S	CNC	SHR
68	S	CNC	SHR
69	S	CNC	SHR
6A	S	CNC	SHR
6B	S	CNC	SHR
6C	S	CNC	SHR
6D	S	CNC	SHR
6E	S	CNC	SHR
6F	S	CNC	SHR
70	S	CNC	SHR
71	S	CTC	SHR
72	P	BL	REC
73	S	CNC	REC
74	P	BL	REC
75	P	BY	REC
76	P	BL	REC
78	P	BL	REC
84	S	CFS	SHR
85	S	CFS	SHR
D4	S	CNC	SHR
D7	S	CNC	SHR
D8	S	CNC	SHR
D9	S	CNC	SHR
DA	S	CNC	SHR

[Edit...](#)

[Partitions...](#)

[Interface Type...](#)

[Create...](#)

[Delete](#)

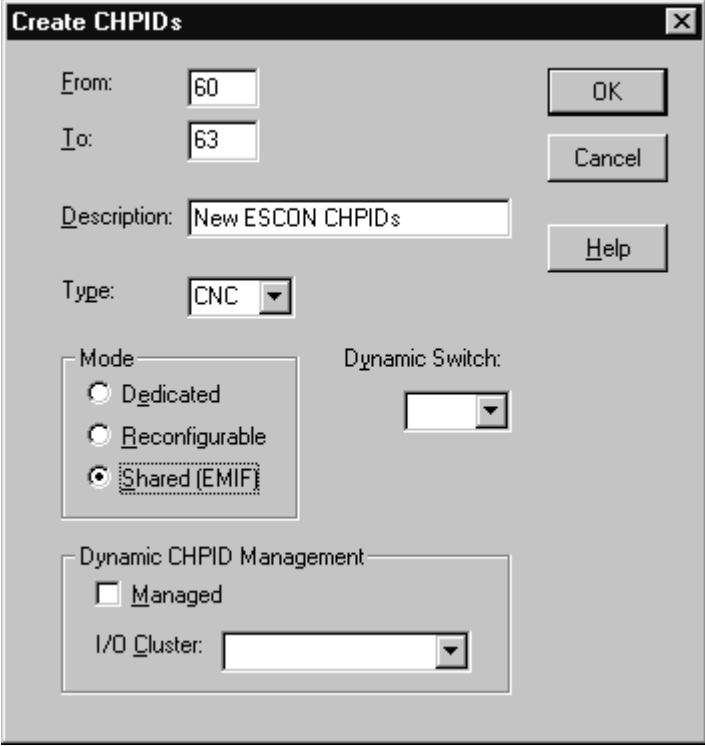
[OK](#)

[Cancel](#)

[Help](#)

[Columns...](#) Partition legend by image number: 1=MVSPROD 2=MVSTEST

4. Click **Create...** This opens the **Create CHPIDs** dialog.
5. Fill in the fields as shown, specifying appropriate CHPID numbers, to create four new shared (SHR) CNC CHPIDs:



**Create CHPIDs**

From: 60

To: 63

Description: New ESCON CHPIDs

Type: CNC

Mode:

- ☐ Dedicated
- ☐ Reconfigurable
- ☒ Shared (EMIF)

Dynamic Switch:

Dynamic CHPID Management:

☐ Managed

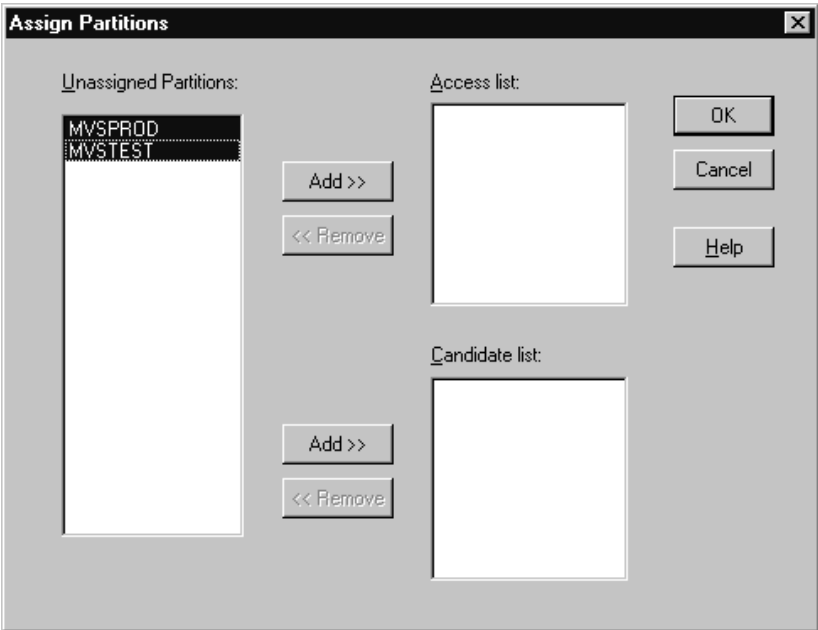
I/O Cluster:

OK

Cancel

Help

- Click **OK**. Since the processor is in LPAR mode, this opens the **Assign Partitions** dialog to choose which partitions to assign to the access and candidate lists of the new CHPIDs.



**Assign Partitions**

Unassigned Partitions:

MVSPROD

MVSTEST

Add >>

<< Remove

Access list:

OK

Cancel

Help

Candidate list:

Add >>

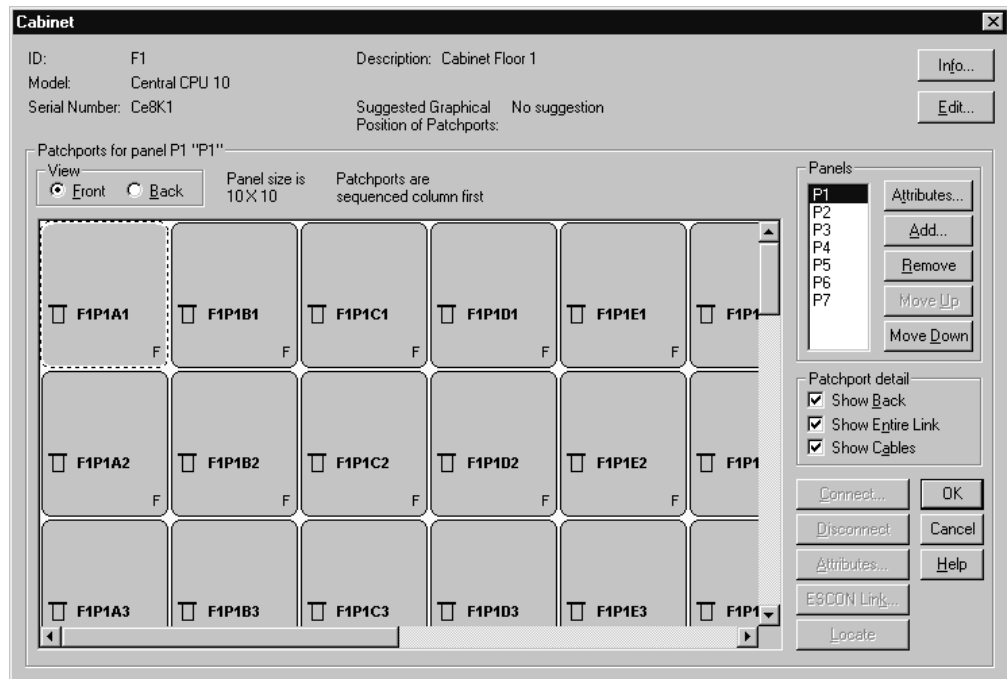
<< Remove

- Select all of the partitions and click **Add>>** beside the access list. This adds the selected partitions to the access list of the four CHPIDs.
- Click **OK** on all open dialogs (besides the **Edit a Processor** dialog) to close them. On the **Edit a Processor** dialog click **Close**. The new CHPIDs have now been added.

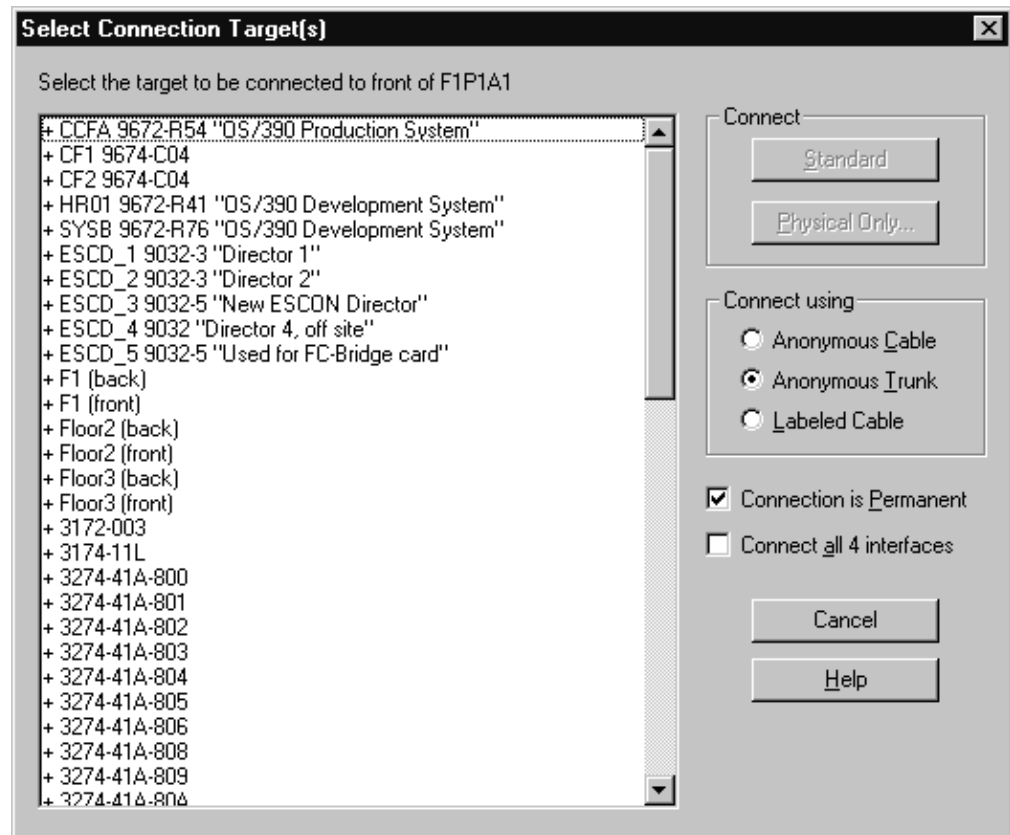
9. Select **View:Filter diagram** and select the **Show All CHPIDs** checkbox to force the new CHPIDs to be included in the diagram.

## Connect the New CHPIDs to Patchports

1. Edit an existing patchport cabinet by either selecting **Edit:Cabinet** and choosing the cabinet from the selection list or by double-clicking on the cabinet in the diagram. This opens the **Cabinet** dialog.
2. Select a panel from the **Panels** list box (in our example, *P1*).



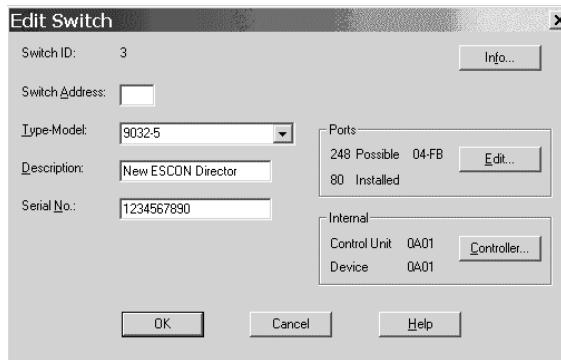
3. Find four consecutive free patchports on the diagram of the patchport panel and select them. You may have to scroll the panel diagram.
4. Click **Connect**. This opens the **Select Connection Target(s)** dialog. In the list box, double-click on the processor with the new CHPIDs (*SYSB 9672-R76*). This expands the list, showing all CHPIDs in the processor.



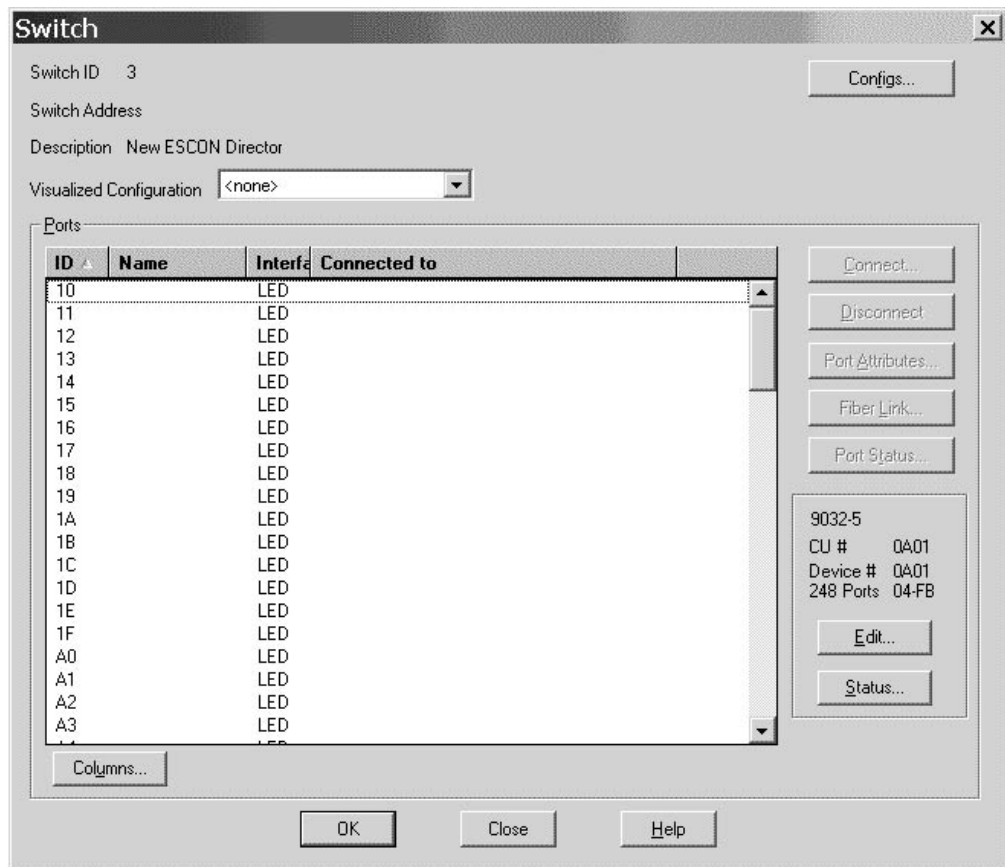
5. Select a CHPID and the "Connect all 4 interfaces" check box. Choose the type of connection you want to use and whether the connection should be permanent.
6. The patchports will be connected to four consecutive CHPIDs, starting with the one you have just selected.
7. Close all open dialogs.
8. Select the **View:Filter Diagram** menu item and select the **Objects Connected to Processors but not to Controllers** and the **Show Patchports** checkbox. The patchports connected to the new CHPIDs will appear in the diagram.

## Add a New ESCON Switch

1. Select **Create:Switch**. This opens a **Create Switch** dialog.
2. Fill in the dialog, specifying appropriate control unit and device numbers, and click **OK**. The new switch will appear selected in the diagram.
3. Edit the new switch by either selecting **Edit:Switch** and choosing the switch from the list or by double-clicking on the switch in the diagram. This opens the **Switch** dialog.
4. Before connecting switch ports to the CHPIDs, we want to mark all ports as installed. Click **Edit**. This opens the **Edit Switch** dialog.



5. Click **Edit** in the **Ports** box. This opens the **Switch Ports** dialog.
6. Select the ports you want to install and click **Install**. The selected ports are now installed.
7. Click on the **Close** button, then **OK** on the **Edit Switch** dialog to return to the **Switch** dialog.

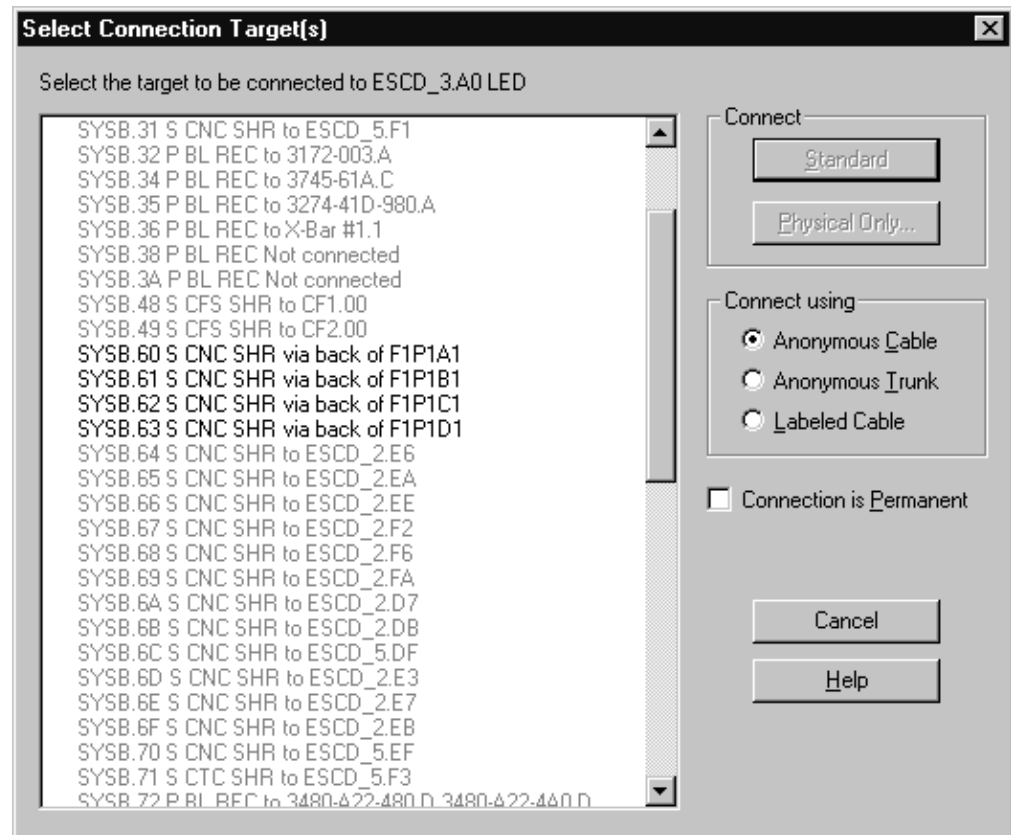


## Connect the New Switch to One of the New CHPIDs

Although the new CHPIDs are already connected to patchports in the cabinet, we specify the CHPID as the target for the connection. The patchport will automatically be connected between the switch port and the CHPID.

1. With the **Switch** dialog still open, select one of the switch ports and click **Connect**. This opens the **Connect Switch Port** dialog.

2. In the list box, double-click on the processor (in our example SYSB) with the four new CHPIDs. This expands the list, showing all CHPIDs in the processor.



3. Double-click on the first of the four new CHPIDs. The connection is made between the switch port and the CHPID.
4. Click OK on all open dialogs to close them. The new connection between the switch and the new CHPID can be seen on the diagram.

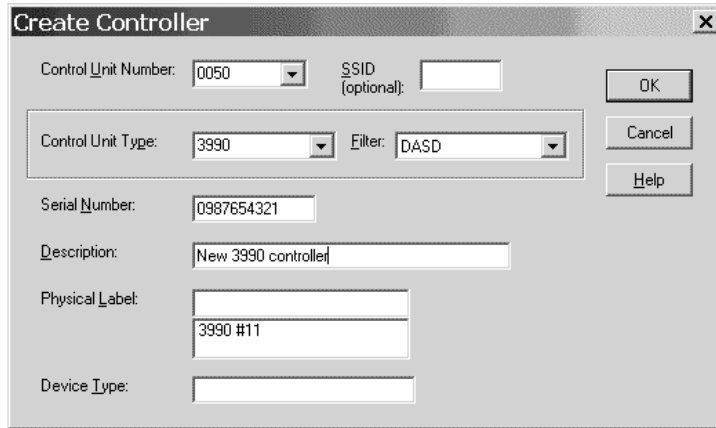
## Connect Another Switch to the Second New CHPID

Follow the procedure above to connect another switch to the second new CHPID. You may have to create the second switch following the procedure above. If there are no free installed switch ports you may have to mark some ports installed as described above.

## Add a New Controller

We will be adding a 3990 DASD subsystem.

1. Select **Create:Controller**. This opens the **Create Controller** dialog. Fill in the values as shown, specifying an unused control unit number, and click **OK**.



**Create Controller**

Control Unit Number: 0050 SSID (optional):

Control Unit Type: 3990 Filter: DASD

Serial Number: 0987654321

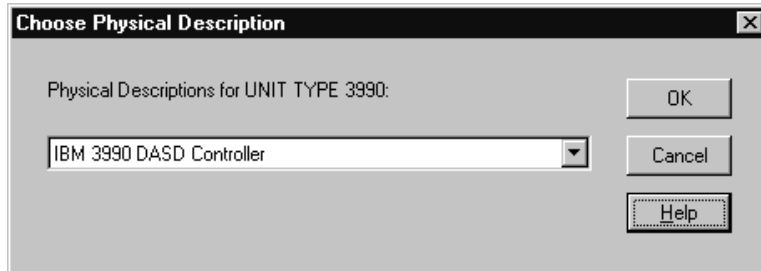
Description: New 3990 controller

Physical Label: 3990 #11

Device Type:

OK Cancel Help

- The **Choose Physical Description** dialog opens. The dialog is displayed when there is more than one physical description possible for the control unit type selected. Select the description as shown and click **OK**.



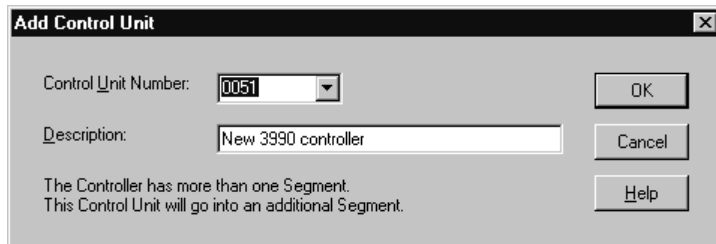
**Choose Physical Description**

Physical Descriptions for UNIT TYPE 3990:

IBM 3990 DASD Controller

OK Cancel Help

- Since a 3990 has two storage clusters (generically called “segments” in HCM), the **Add Control Unit** dialog is opened to create a second control unit for the second segment.



**Add Control Unit**

Control Unit Number: 0051

Description: New 3990 controller

The Controller has more than one Segment.  
This Control Unit will go into an additional Segment.

OK Cancel Help

- Enter an unused control unit number and click **OK**.
- The new controller appears selected on the diagram.

## Connect the Controller to CHPIDs

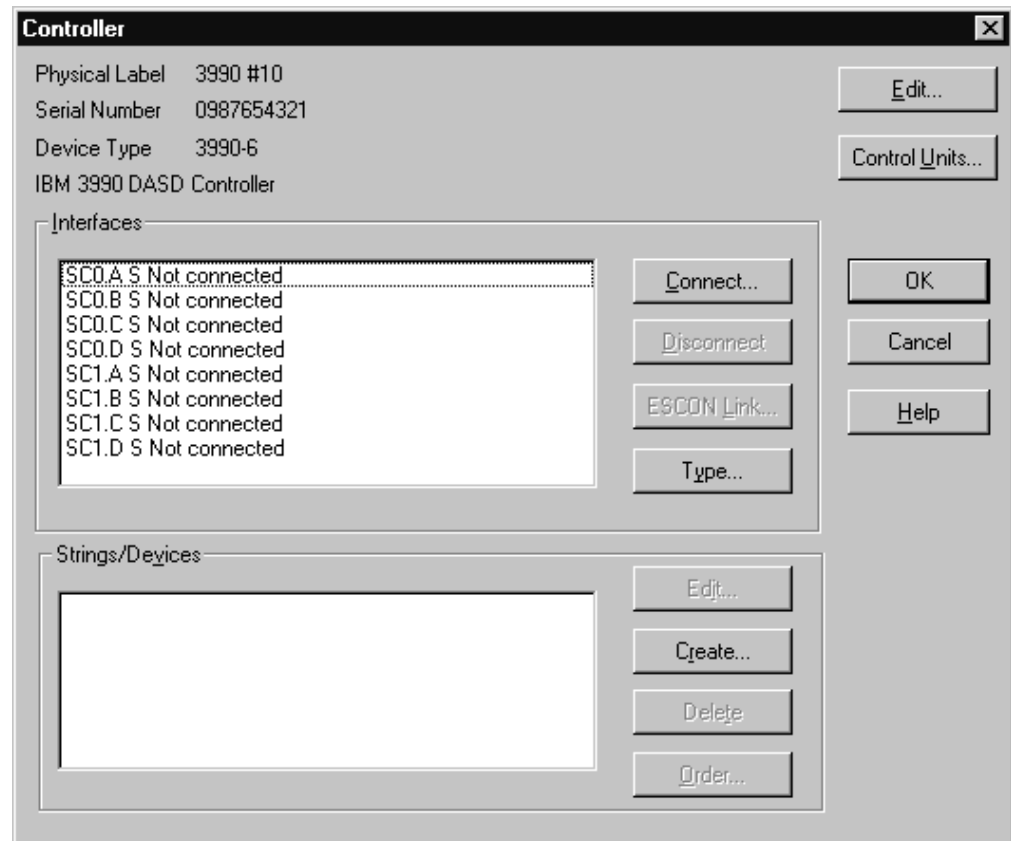
There are two ways to connect a string of devices to a processor with HCM. One way is to connect the controller(s) to the CHPID(s) first (possibly through switches and patchport cabinets), then connect the strings to the controllers. We call this “connecting top-down”. Alternately, you can connect the strings to the controllers first, then connect the controllers to the CHPID(s). We call this “connecting bottom-up”.

The advantage of connecting top-down is that you are given immediate feedback about available unit addresses when you connect strings to controllers. The

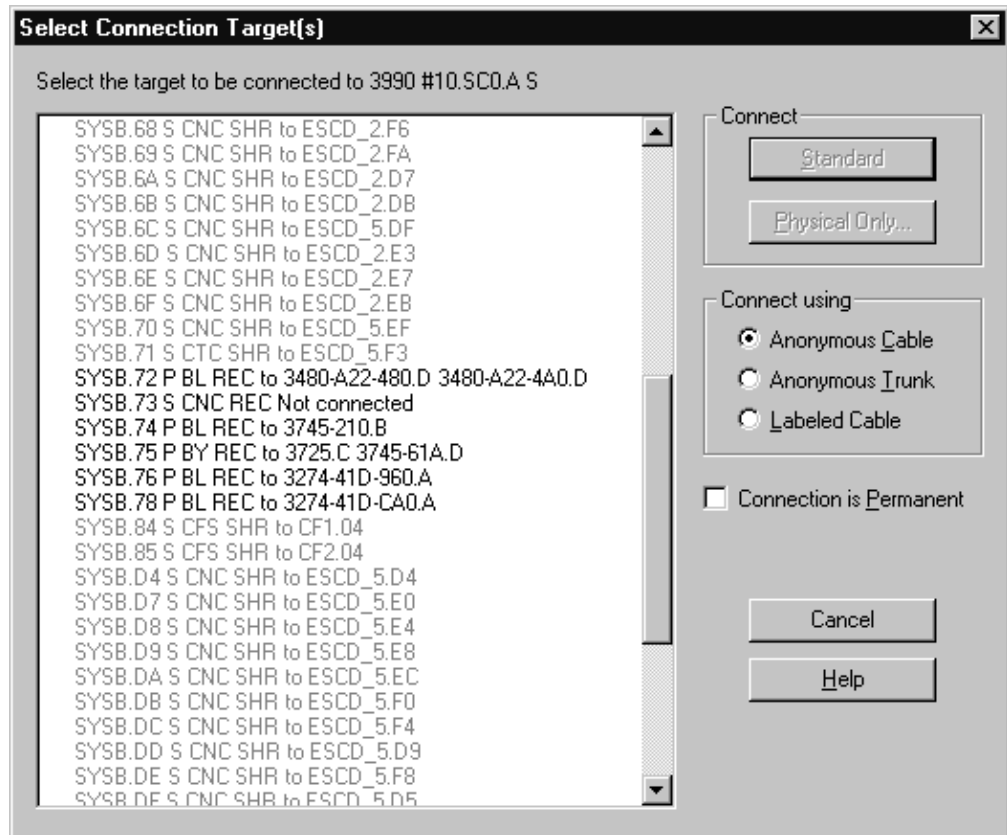
advantage of connecting bottom-up is that when you connect a controller with strings to a CHPID, only the unit address ranges that are used by the connected devices are defined for the controller, instead of the default unit address range of 00 through 64.

We will be connecting top-down, starting with connecting one channel interface on each segment of the new controller to a CHPID.

1. Edit the new controller by either selecting **Edit:Controller** and choosing the controller from the list or by double-clicking on the controller in the diagram. This opens the **Controller** dialog.



2. Select a free channel interface on the first segment (for example, SC0.A) and click **Connect**. This opens the **Select Connection Target(s)** dialog.



3. Choose the desired processor (in our example SYSB) from the list and double-click it to expand it. This lists all of the CHPIDs in the processor.
4. Select a SHR CNC CHPID with no connection and click **Standard** in the **Connect** box. A *standard connection* makes the physical connection and all appropriate logical definitions, using standard values.

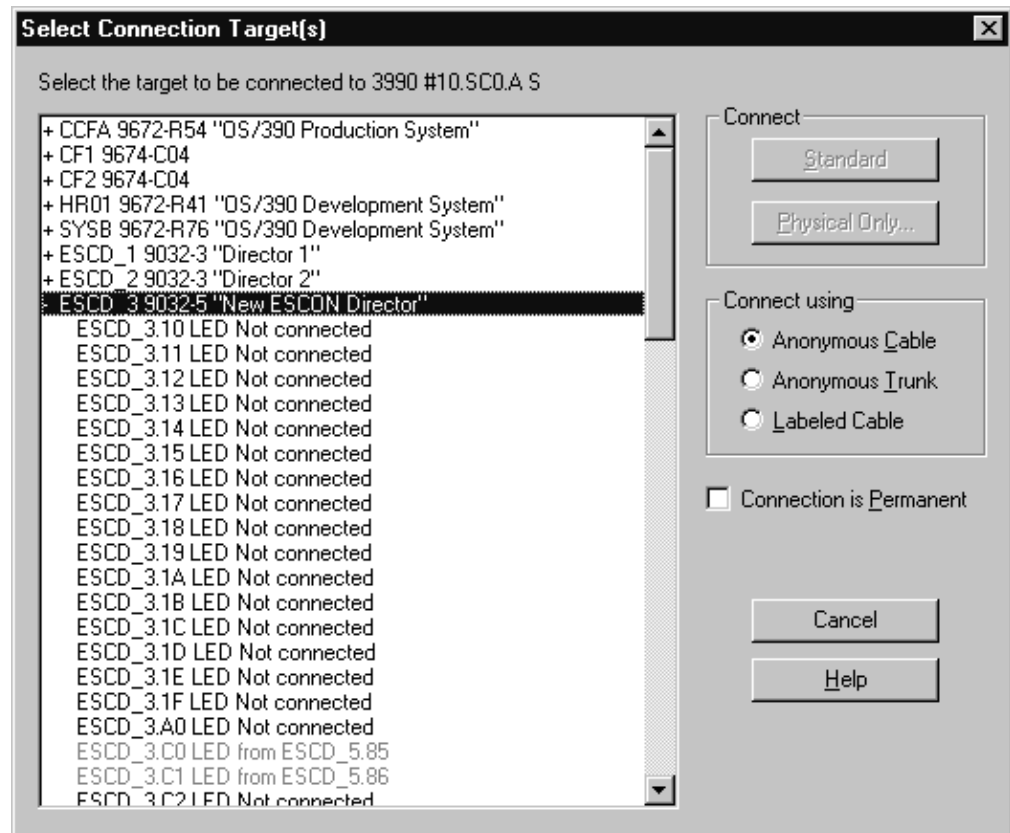
The connection is now made including all definitions between the control unit and the CHPID and its processor. Had there been devices connected to the control unit, definitions would also have been made between the devices and the partitions and the processor.

5. You are now back in the **Controller** dialog. Select a free channel interface on the second segment (e.g. SC1.A) and connect it to another SHR CNC CHPID following the procedure above.
6. Click **OK** on all open dialogs to close them. The connections between the controller and the CHPIDs appear on the diagram. When the controller is selected, the full connection is highlighted from the controller to the CHPIDs, and to any partitions that can access the CHPIDs.

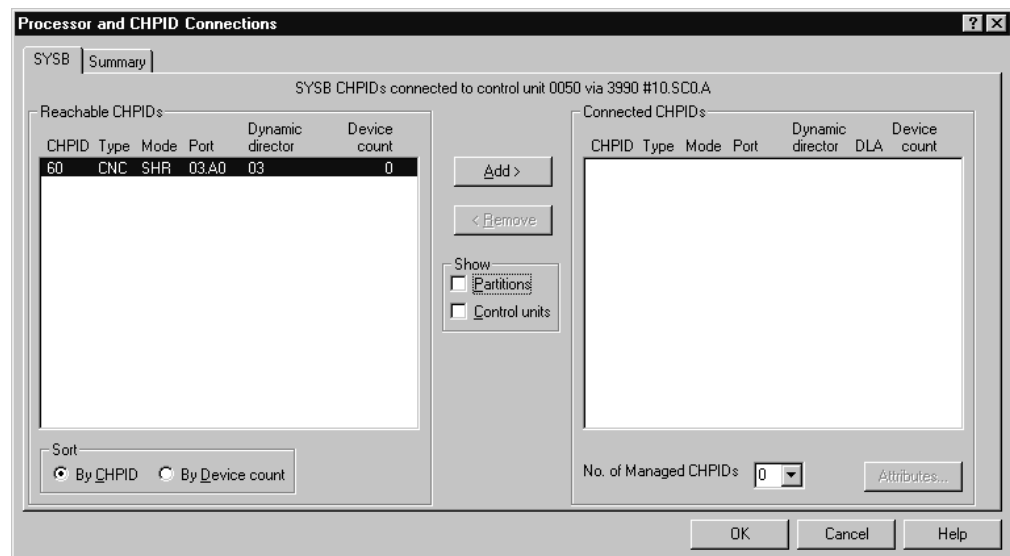
## Connect the Controller to the ESCON Switches

We will connect a second channel interface on each segment of the new controller through a switch and on to the new CHPIDs.

1. Open the **Controller** dialog for the new controller as above.
2. Select a free channel interface on the first segment (e.g. SC0.B) and click **Connect**. This opens the **Select Connection Target(s)** dialog.
3. Choose the new switch from the list and double-click it to expand it. This lists all of the installed ports in the new switch.



4. Select a port with no connection and click **Standard** in the **Connect** box. A *standard connection* makes the physical connection and all appropriate logical definitions, using standard values.
5. The **Processor and CHPID Connections** dialog is opened, where you can specify the CHPIDs to which the control unit will be defined.



6. In the **Processor and CHPID Connections** dialog, from the tabs first select the processor you want the control unit to connect with. Then select the desired CHPID(s), click **Add** to move them to the **Connected CHPIDs** list, and click **OK**.

The connection is now made including all definitions among the control unit, the switch ports, the CHPID and the processor. Had there been devices connected to the control unit, the definitions would also have been made between the devices and the partitions and the processor.

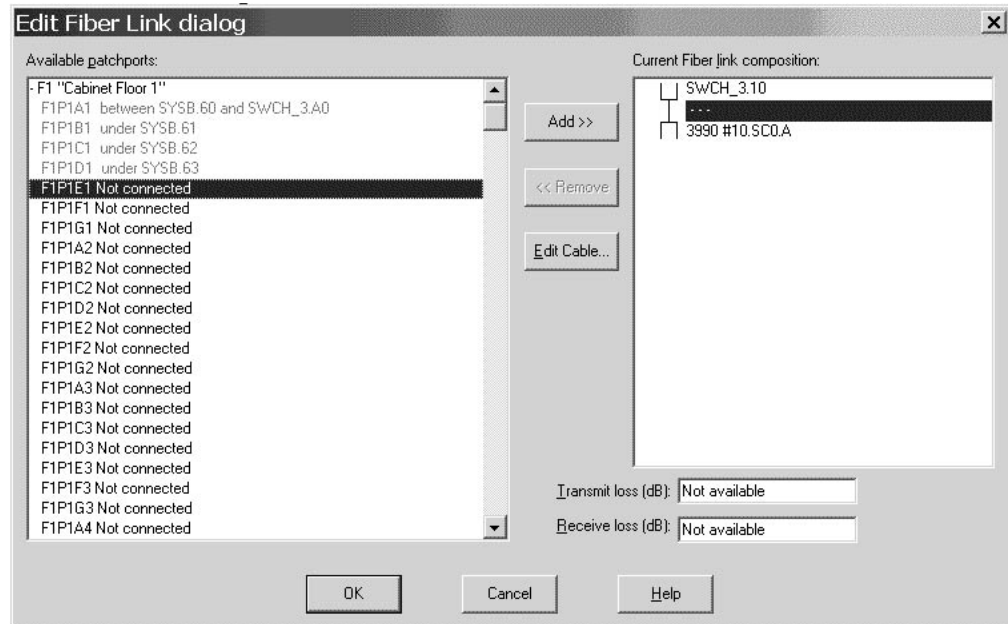
7. You are now in the **Controller** dialog. Select a free channel interface on the other segment (e.g. SC1.B) and connect it through the second switch to the second new CHPID following the procedure above.
8. Click **OK** on all open dialogs to close them. The connections between the controller and the switches appear on the diagram. When the controller is selected, the full connection is highlighted from the controller through the switches and the patchports, to the CHPIDs, and finally to the partitions.

## Define the Fiber Links for the Connections

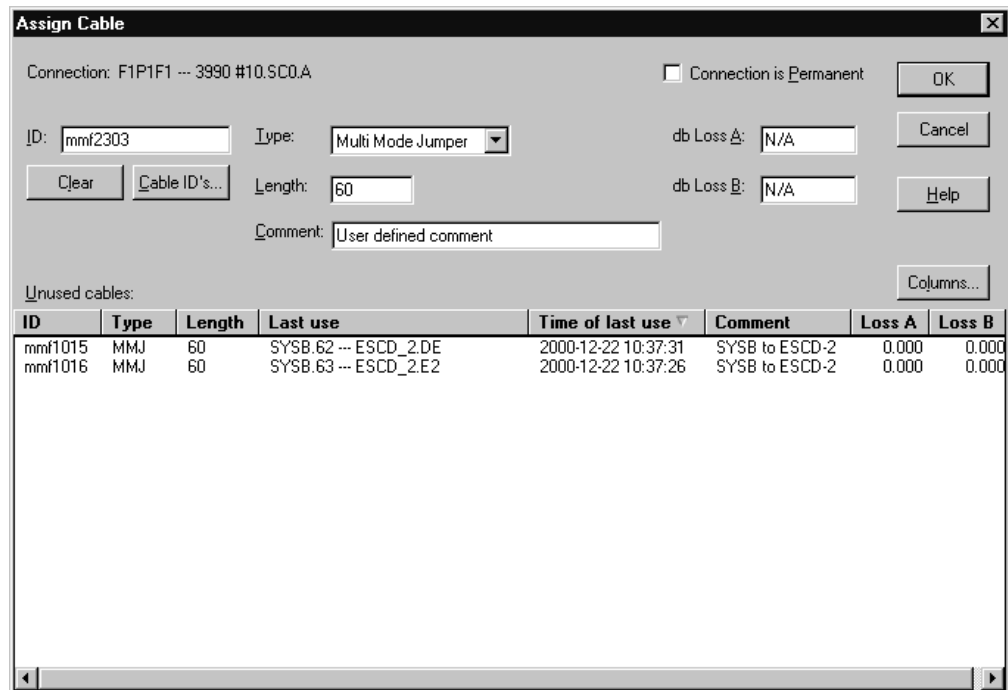
When a connection is made between two pieces of equipment no cable is initially assigned to the connection. You can assign cables, complete with labels, types, and lengths, to the connections in your configuration. This information can then appear on the diagram and can be printed in reports. If the connection is between two fiber transceivers, you can add patchports to the fiber link.

We will route one of the connections we just made between the new controller and a switch, passing through a patchport cabinet, and label the cables involved.

1. Edit the new controller.
2. In the **Controller** dialog, select (do not double-click) one of the two channel interfaces that are connected to switches. Because this is a fiber interface, the **Fiber Link** button is enabled.
3. Click **Fiber Link**. The **Edit Fiber Link** dialog is opened. It shows the composition of the fiber link in the box to the right. Right now the only thing between the channel interface and the switch port is a connection with no cable, represented by “- - -”.
4. Click (do not double-click) on the connection (the “- - -”) to indicate where we want to insert a patchport. This causes the list box on the left side to list all patchport cabinets in the configuration.
5. Choose the desired cabinet and double-click on it. This expands the list to show all patchports in the cabinet.



6. Select a free patchport and click **Add>>**.
7. The **Add Patchport to Fiber Link** dialog appears. You can decide whether you want to connect the cables to the front or to the back side of the patchport. This inserts the patchport into the fiber link such that there are now two unlabeled cables on either side of it. Press **OK**.
8. Now we will label one of the cables. Select the "--" between the controller and the patchport and click **Edit Cable**. This opens the **Assign Cable** dialog.

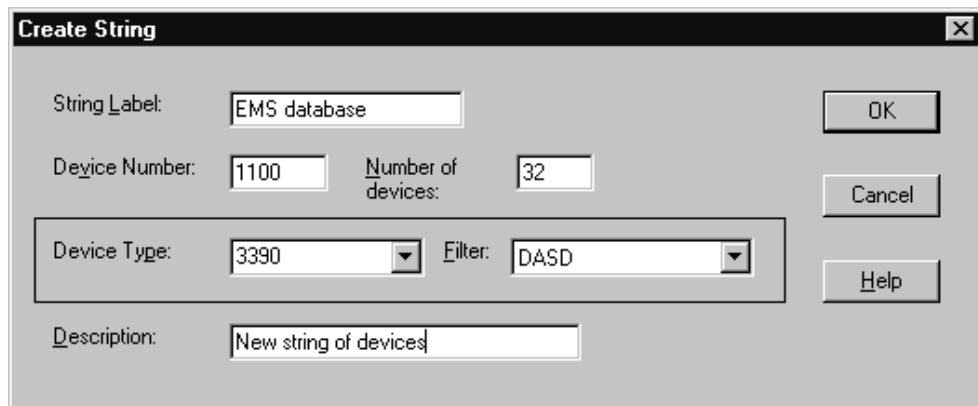


9. Fill in the cable's ID, type, length, and optionally the Comment field, or select an existing cable from the unused cables list. Then, click **OK**. The cable's new label now appears in the **Fiber Link** dialog.

10. Label the other cable in the same way.
11. Click **OK** to return to the **Controller** dialog. You can edit the fiber links of the other connected channel interfaces by following the same procedure.
12. Click **OK** on all open dialogs to close them.
13. Use the **Locate:Controller** menu item to zoom in on the new controller. Select **View:Text Detail** and check the **Cable Description** checkbox. The cable labels will now appear on the diagram.

## Add Some Strings to the New Controller

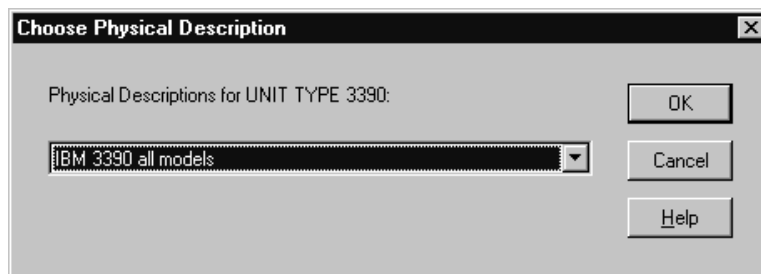
1. Select **Create:String**. This opens the **Create String** dialog.



The 'Create String' dialog box is shown with the following fields and controls:

- String Label:** Text box containing 'EMS database'.
- Device Number:** Text box containing '1100'.
- Number of devices:** Text box containing '32'.
- Device Type:** Dropdown menu showing '3390'.
- Filter:** Dropdown menu showing 'DASD'.
- Description:** Text box containing 'New string of devices'.
- Buttons:** OK, Cancel, and Help.

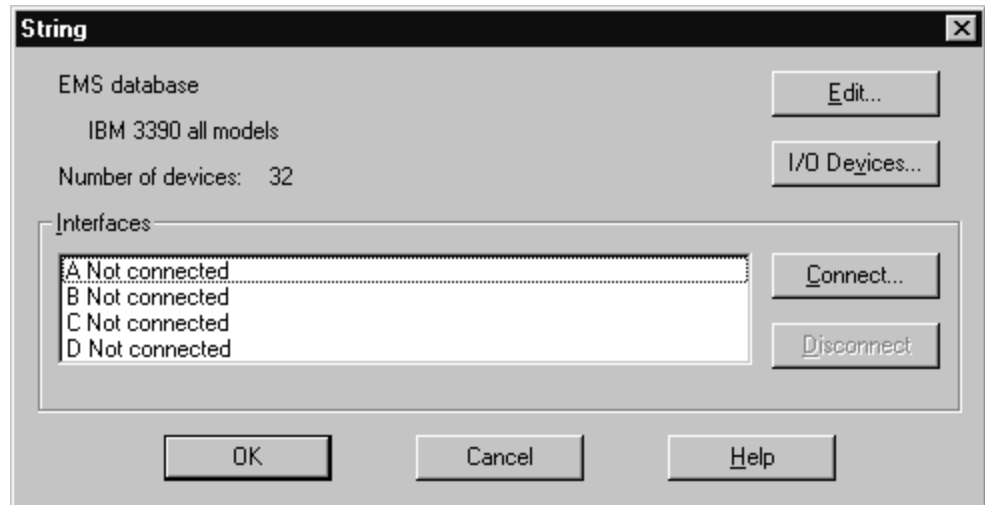
2. Fill in the **Create String** dialog as shown, specifying an appropriate device number.
3. Since there is more than one physical description for this unit type, the **Choose Physical Description** dialog is opened. Choose the appropriate physical description and click **OK**.



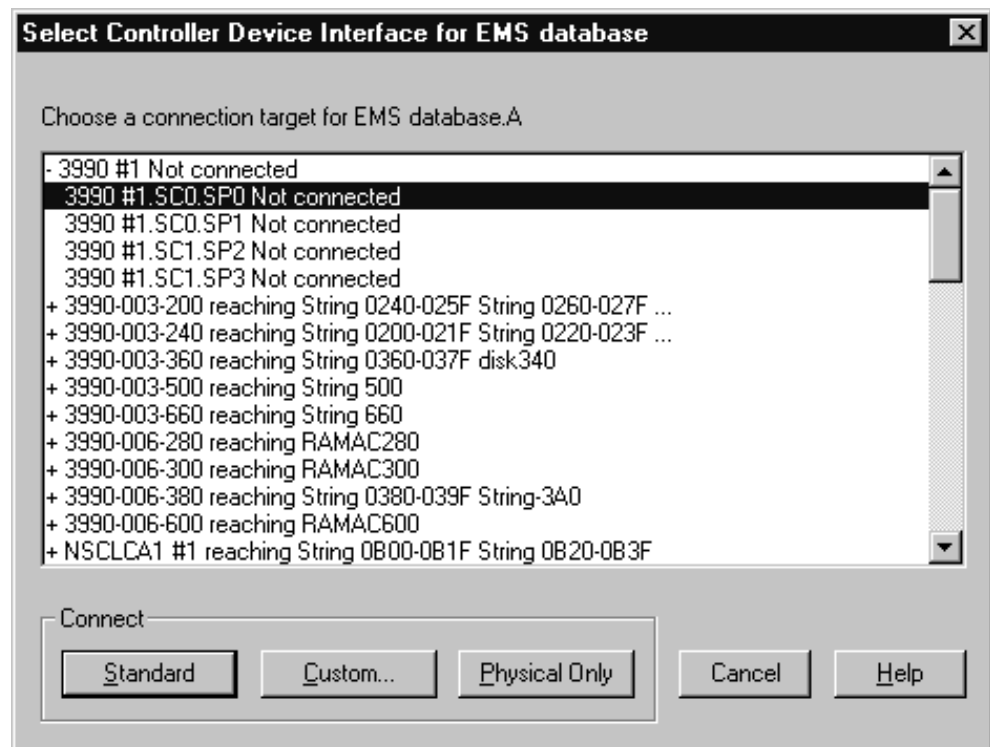
The 'Choose Physical Description' dialog box is shown with the following fields and controls:

- Title:** Choose Physical Description.
- Text:** Physical Descriptions for UNIT TYPE 3390:
- Dropdown:** A list box showing 'IBM 3390 all models'.
- Buttons:** OK, Cancel, and Help.

4. This creates a string of 32 devices. Double-click on the new string on the diagram to open the **String** dialog. (Tip: position the mouse cursor in the top rectangle of the string.)



5. Select the first string interface (A) and click **Connect**. This opens the **Select Controller Device Interface** dialog.



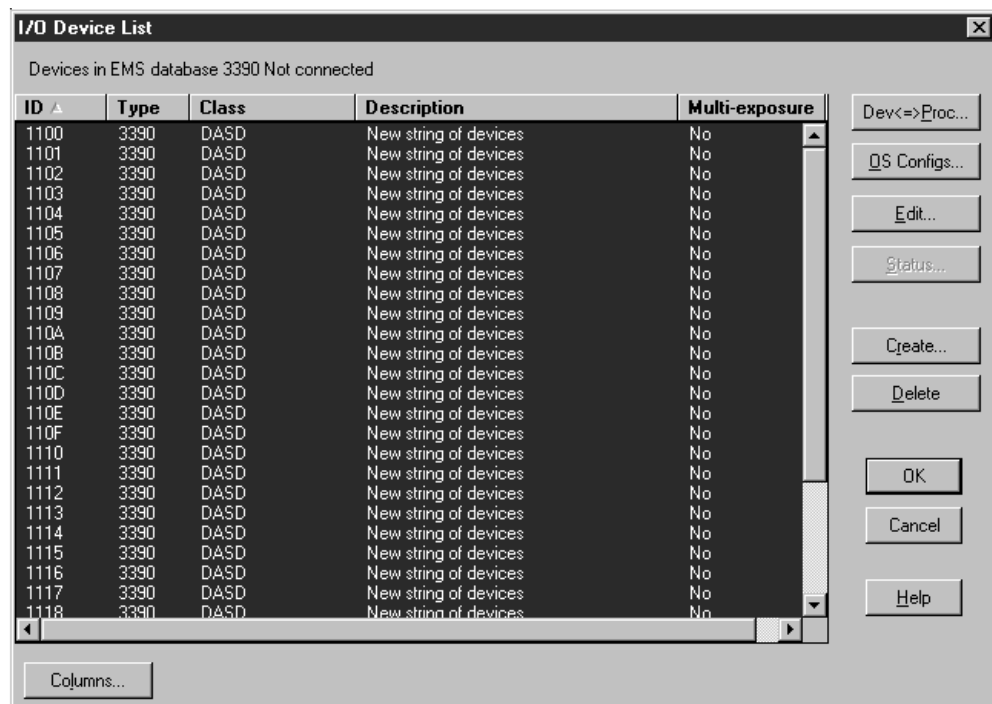
6. Double-click on the new controller and choose the storage processor (generically called a “device interface” in HCM) to connect to and double-click on it.  
The connection is now made including all definitions between the devices and the control unit, CHPIDs, partitions, and processor.
7. In the **String** dialog, select the remaining string interfaces (B, C, and D) and click **connect**. This will open the **Select Controller Device Interface** dialog three times in sequence to connect the string interfaces to the remaining device interfaces of the new controller.

8. Create a second string of 3390 devices and also connect it to the new controller using the same procedure. The second string will be connected after the first one on the daisy-chain.
9. Click **OK** on all open dialogs to close them. The connections between the string and the controller appear on the diagram. When the string is selected, the full connection is highlighted from the string all the way to the partitions.

## Define the Devices to the Operating System

The newly created devices still need to be defined to the appropriate operating system.

1. Edit one of the new strings by either selecting **Edit:String** and choosing the string from the list or by double-clicking on the string in the diagram. This opens the **String** dialog.
2. Click **I/O Devices**. This opens the **I/O Device List** dialog. By default all devices in the string are selected so that we can define them all to the operating system at once.



3. Click **OS Configs**. This opens a dialog that lists all operating system configurations in the IODE.
4. Choose the operating system configuration to which you want to define these devices and click **Define**. This opens the **Define Device <==> OS Configuration Parameters** dialog that lists all of the parameters that determine the device <==> OS definitions.

**Define Device <=> OS Configuration Parameters** [X]

Device Number: 1100      OS Config: MVSPROD      [OK]

Number of devices: 32      Type: MVS      [Cancel]

Type: 3390      Description: Development      [Help]

Parameter	Value	Req	Description	
OFFLINE	<input type="checkbox"/>		Device considered online or offline at IPL	[?]
DYNAMIC	<input checked="" type="checkbox"/>		Device supports dynamic configuration	[?]
LOCANY	<input type="checkbox"/>		UCB can reside in 31 bit storage	[?]
SHARED	<input type="checkbox"/>		Device shared with other systems	[?]
SHAREDUP	<input type="checkbox"/>		Shared when system physically partitioned	[?]

5. Set the parameters appropriately and click **OK**. This defines the devices to the selected OS configuration.
6. Click **OK** or **Close** on all open dialogs to close them.
7. Save your configuration file.

You have now completely installed and connected the new strings and the controller through the new switch.

---

## Scenario II – Defining a CTC Connection

In this scenario we create CTC connections involving three processors routed through a switch. We assume that the following processors and unconnected CHPIDs exist:

Processor PROC1 (LPAR mode with partitions LPAR11 and LPAR12)

**CHPIDS:**

20 CTC SHR (both partitions in the access list)

21 CNC SHR (both partitions in the access list)

Processor PROC2 (LPAR mode with partitions LPAR21 and LPAR22)

**CHPIDS:**

20 CTC DED (LPAR21 in the access list)

Processor PROC3 (Basic mode)

**CHPIDS**

21 CNC DED

We also assume that an operating system exists and that an ESCON Director 01 (9032) exists with ports E0-E3 free.

We will create four CTC connections:

PROC1.20 CTC to PROC1.21 CNC (wraparound)

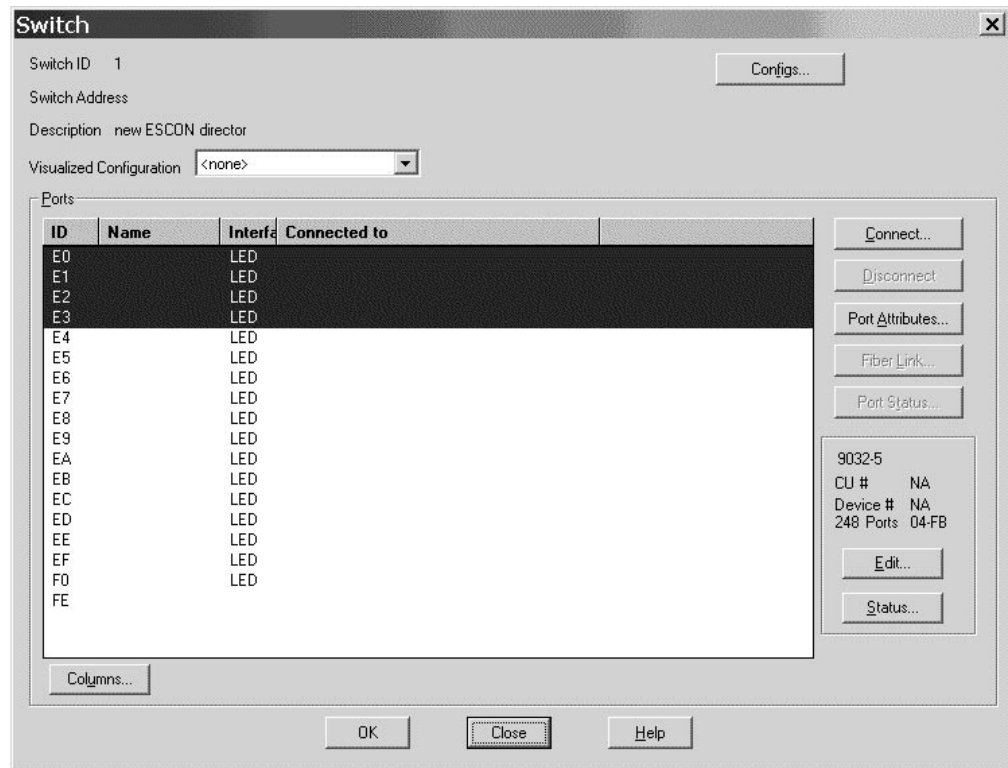
PROC2.20 CTC to PROC1.21 CNC

PROC1.20 CTC to PROC3.21 CNC

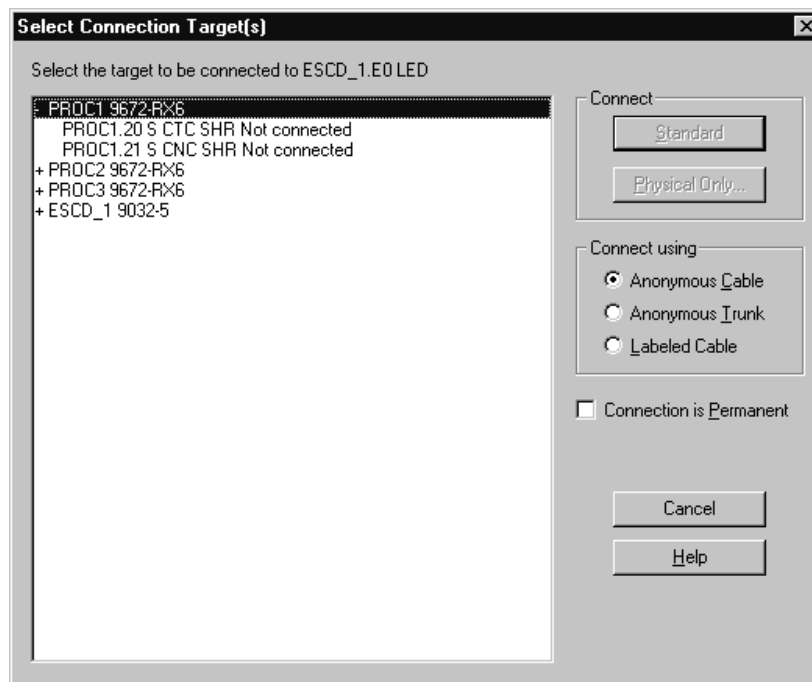
PROC2.20 CTC to PROC3.21 CNC

### Connect a Switch to the CHPIDs

1. Edit the switch by either selecting **Switch** from the **Edit** menu and choosing the switch from the list or by double-clicking on the switch in the diagram. This opens the **Switch** dialog.



2. Select four free ports and click **Connect**. This will open the **Select Connection Target(s)** dialog four times in sequence, once for each port.



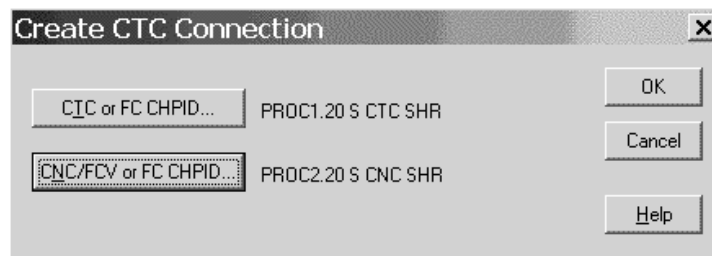
3. In the **Select Connection Target(s)** list, double-click on processor PROC1 to expand the list, showing all CHPIDs in the processor.
4. Double-click on CHPID PROC1.20 CTC SHR. The connection is made between the switch port and the CHPID.

5. The **Select Connection Target(s)** list will reappear three more times, allowing you to connect CHPIDs PROC1.21, PROC2.20 and PROC3.21 to the switch (ports E1 – E3).
6. Close the **Switch** dialog and select **Filter diagram** from the **View** menu. Enable the **Show All CHPIDs** item. The new connections will appear on the diagram.

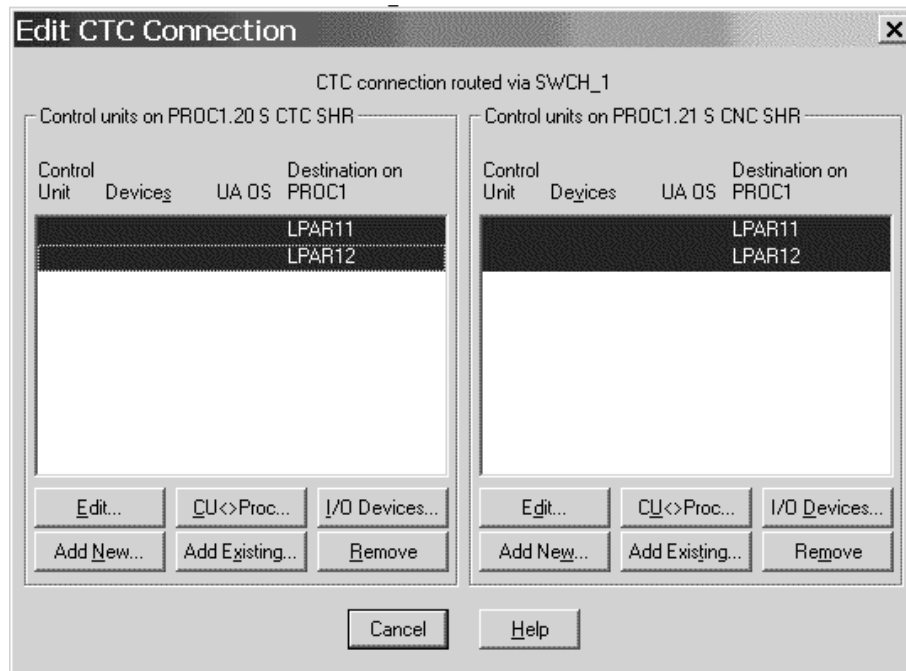
## Create the First CTC Connection

HCM considers a CTC connection as a single entity comprising selected control units and I/O devices connected to the CHPIDs.

1. Select **CTC connection...** from the **Create** menu. This opens the **Create CTC Connection** dialog.
2. Click the **CTC or FC CHPID** button and select PROC1.20 CTC SHR. Even though the CHPIDs are connected to switch port, we select the CHPIDs that are to be connected. Click the second **CNC/FCV or FC CHPID** button and select PROC1.21 CNC SHR.

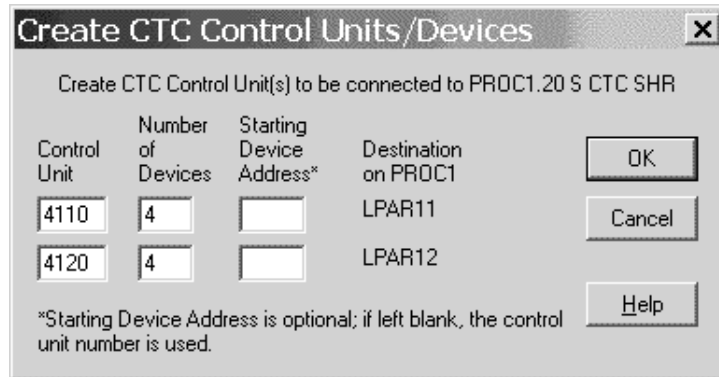


3. Click **OK**. The **Edit CTC Connection** dialog will automatically appear to allow you to define the control units that are part of the connection.



4. Click the **Add New...** button on the left-hand side to create the control units and devices that will be connected to PROC1.20 CTC to represent the images available via PROC1.21 CNC.

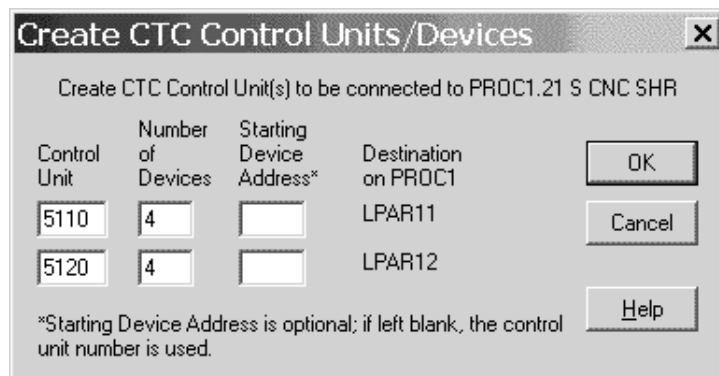
5. Enter control unit number 4110 to represent LPAR11 and control unit number 4120 to represent LPAR12. Leave the other controls as they appear and click **OK**. This will create control unit 4110 CTC with devices 4110,4 CTC and control unit 4120 CTC and devices 4120,4 CTC and connect them to CHPID PROC1.20 CTC so as to represent the two partitions.



Control Unit	Number of Devices	Starting Device Address*	Destination on PROC1
4110	4		LPAR11
4120	4		LPAR12

\*Starting Device Address is optional; if left blank, the control unit number is used.

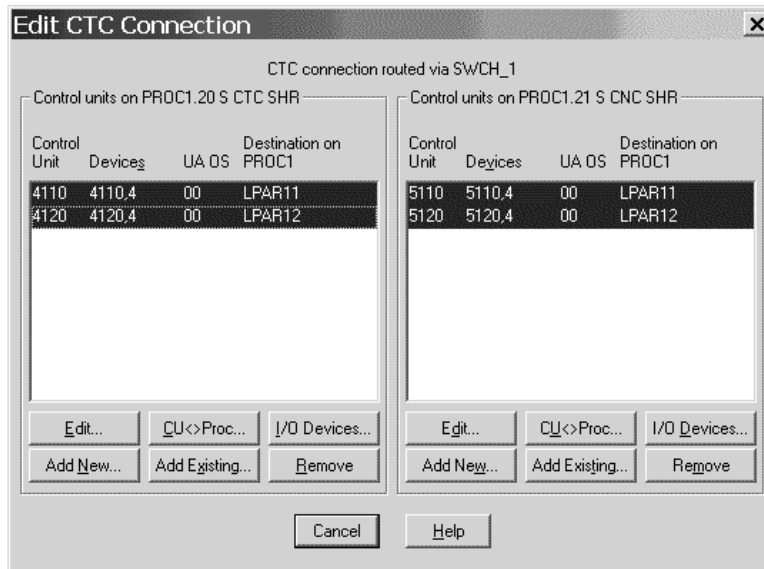
6. Click the **Add New...** button on the right-hand side to create the control units and devices that will be connected to PROC1.21 CNC to represent the images available via PROC1.20 CTC.



Control Unit	Number of Devices	Starting Device Address*	Destination on PROC1
5110	4		LPAR11
5120	4		LPAR12

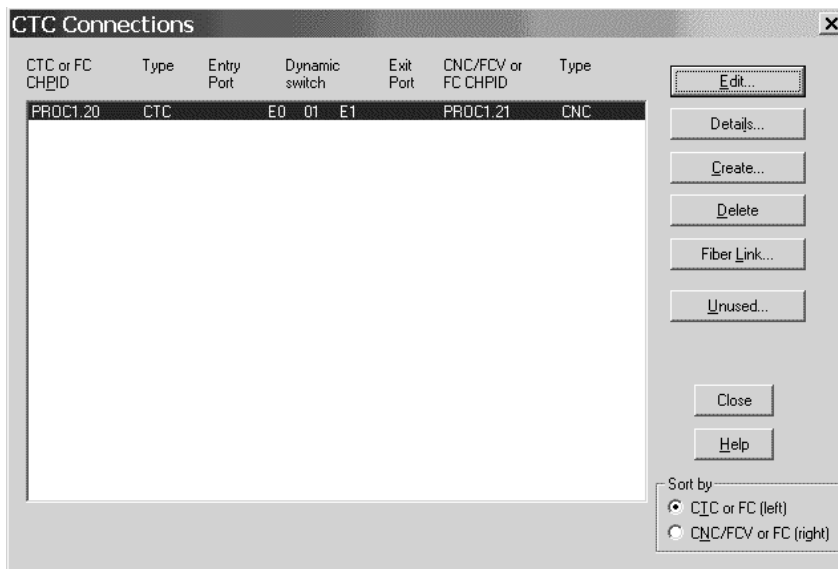
\*Starting Device Address is optional; if left blank, the control unit number is used.

7. Enter control unit numbers 5110 and 5120 to represent the two images and click **OK**. The **Edit CTC Connection** dialog will reappear as follows:

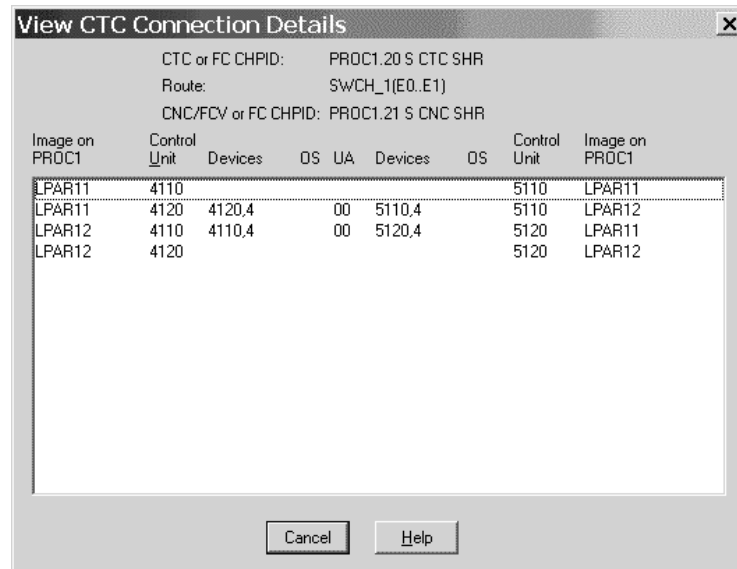


This shows that the connection is fully specified with all images duly represented by control units. Clicking on **I/O Devices...** followed by **Dev <=> Proc...** shows that each of the devices has been set up with explicit candidate lists so that no partition has access to the devices that represent it.

8. Close the **Edit CTC Connection** dialog and choose **CTC connections...** from the **Edit** menu to open the **CTC Connections** dialog. The connection between PROC1.20 CTC and PROC1.21 CNC will appear in the dialog.



9. Select the entry in the list box and click **Details...** to open the **View CTC Connection Details** button.

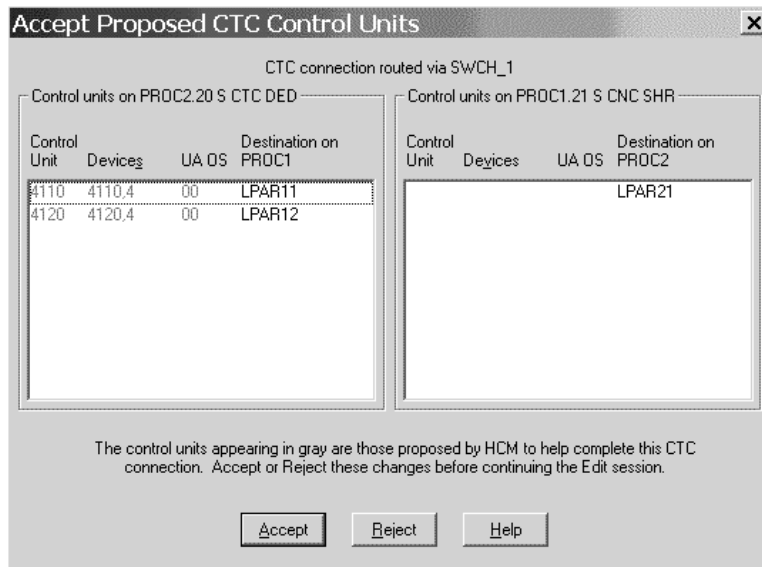


10. This gives another view of the connection, indicating that the two partitions are able to communicate with each other but not to themselves because of the setup of the device candidate lists.
11. Click **Cancel** to return to the **CTC Connections** dialog.

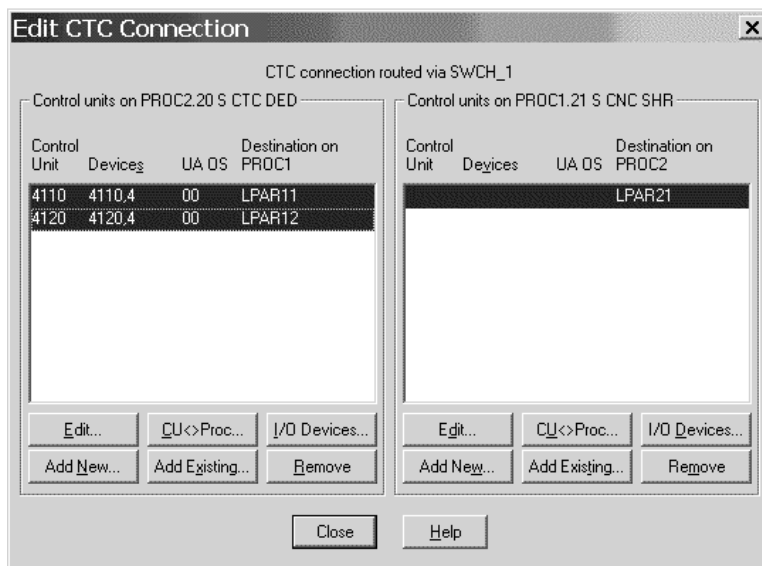
## Create the Second CTC Connection

The second connection is between PROC2.20 CTC and PROC1.21 CNC. In this case, we have already created control units and devices that may be used to represent partitions LPAR11 and LPAR12 via PROC1.21 CNC; we need only connect them appropriately to PROC2.20 CTC. We will have to create a control unit and 4 devices to represent the single partition (LPAR21) that is available via PROC2.20 CTC.

1. Click **Create...** on the **CTC Connections** dialog.
2. Click the **CTC or FC CHPID** button and select PROC2.20 CTC DED.
3. Click the second **CNC/FCV or FC CHPID** button and select PROC1.21 CNC SHR.
4. Click **OK**. The **Accept Proposed CTC Control Units** dialog to propose control units 4110 and 4120 to be connected to PROC2.20 CTC so as to represent LPAR11 and LPAR12, respectively.



- Click **Accept** to connect the control units to PROC2.20. The **Edit CTC Connection** dialog will appear showing that the CTC side has been defined. Note that the CNC side of the dialog shows that there is only one image to be represented. This is because PROC2.20 CTC is dedicated to one partition, LPAR21. As yet, there is no control unit to represent LPAR21.



- Click the **Add New...** button on the righthand side to create the control unit and devices that will be connected to PROC1.21 CNC to represent the partition (LPAR21) available via PROC2.20 CTC. Use control unit 5210 and devices 5210,4.
- Close the **Edit CTC Connection** dialog. The **CTC Connections** dialog will reappear showing the new connection.

## Create the Third CTC Connection

The third connection is between PROC2.20 CTC and PROC3.21 CNC. In this case we have a control unit and 4 devices that may be used to represent LPAR21 via PROC2.20 CTC, but we will need to create a control unit and devices to represent PROC3 via PROC3.21 CNC.

1. Click **Create...** on the **CTC Connections** dialog.
2. Click the **CTC or FC CHPID** button and select PROC2.20 CTC DED.
3. Click the second **CNC/FCV or FC CHPID** button and select PROC3.21 CNC DED.
4. Click **OK**. The **Accept Proposed CTC Control Units** dialog to propose control unit 5210 to be connected to PROC3.21 CNC so as to represent LPAR21.
5. Click **Accept** to connect the control unit to PROC3.21.
6. The **Edit CTC Connection** dialog will appear showing that the CNC side has been defined, but there is no control units to represent image PROC3 on PROC2.20 CTC.
7. Click the **Add New...** button on the lefthand side to create the control unit and devices that will be connected to PROC2.20 CTC to represent PROC3 via PROC3.21 CNC. Use control unit 4300 and devices 4300,4.
8. Close the **Edit CTC Connection** dialog. The **CTC Connections** dialog will reappear showing the new connection.

## Create the Last CTC Connection

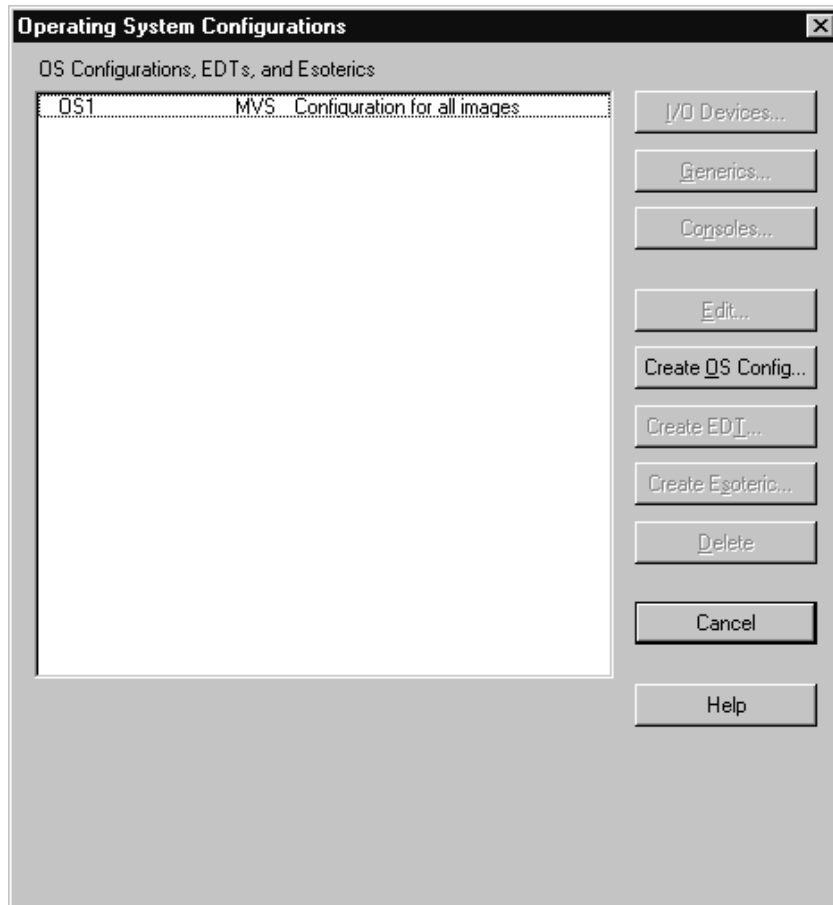
The final connection is between PROC1.20 CTC and PROC3.21 CNC. In this case control units have already been created to represent all of the images involved. During the create process, HCM will propose these control units to be connected to the CHPIDs, and we need only accept these proposals to complete the connection.

1. Click **Create...** on the **CTC Connections** dialog.
2. Click the **CTC or FC CHPID** button and select PROC1.20 CTC DED.
3. Click the second **CNC/FCV or FC CHPID** button and select PROC3.21 CNC DED.
4. Click **OK**. The **Accept Proposed CTC Control Units** dialog to propose control unit 4300 to connected to PROC1.20 CTC so as to represent PROC3, and control units 5110 and 5120 to be connected to PROC3.21 CNC so as to represent LPAR11 and LPAR12.
5. Click **Accept** to connect the control units. The **Edit CTC Connection** dialog will appear showing the fully defined connection.
6. Close the **Edit CTC Connection** dialog. The **CTC Connections** dialog will reappear showing the new connection. Close the **CTC Connections** dialog.

## Define the CTC Devices to the OS Configuration

Assuming one OS configuration (OS1) will be used for all four images in the connection, the last step is to define the new devices to the OS configuration.

1. Select **Edit:OS configurations...** to open the **Operating System Configurations** dialog.



2. Select OS1 from the list box and click **I/O Devices...** to open the **List Devices for OS Configuration** dialog.
3. Click **Add...** to open the **Add I/O Devices to OS Configuration** dialog. This will show all the devices in the configuration that are not yet defined to OS1.
4. Toggle **Use Filter** to “on” and click **Filter...** to open the **Filter I/O Device List** dialog.

**Filter I/O Device List**

List only the devices that match all of the following criteria:

Type:

Class:

Serial Number:

Description:

Control Units

☒ No CU Filtering

☐ Not Connected

☐ Connected

Specific CU:  or  or  or

Operating Systems

☒ No OS Filtering

☐ Not Defined

☐ Defined

Processor/Partition:

OK Cancel Help

- Enter "CTC" in the **Type** field and click **OK**. The **Add I/O Devices to OS Configuration** will reappear showing only CTC devices.

**Add I/O Devices to OS Configuration**

Add devices to OS Config OS1

Device	Type	OS Control Units
+ 4110,4	SCTC	4110
+ 4120,4	SCTC	4120
+ 4300,4	SCTC	4300
+ 5110,4	SCTC	5110
+ 5120,4	SCTC	5120
+ 5210,4	SCTC	5210

OK Cancel Help

View

☒ Control Units ☐ Description ☐ Serial Number

☒ Use Filter

Filter...

- Select all of the devices in the list and click **OK**. The **Define Device <==> OS Configuration Parameters** dialog will appear.

Define Device <=> OS Configuration Parameters

Device Number: 4110
OS Config: OS1

Number of devices: 24
Type: MVS

Type: SCTC
Description: Configuration for all images

OK

Cancel

Help

Parameter	Value	Req	Description
OFFLINE	<input type="checkbox"/>		Device considered online or offline at IPL
DYNAMIC	<input checked="" type="checkbox"/>		Device has been defined to be dynamic
?PARM15?	<input type="text"/>		

- Set up the OFFLINE and DYNAMIC parameters as appropriate and click **OK**. This will define all of the CTC devices to the OS configuration. Close all open dialogs.

---

## Scenario III – Defining a Fiber Cabling Infrastructure

In this example, the logical configuration already exists. Within this scenario we will describe how you can add the physical objects to an already existing logical configuration, for example, after a **Load** process.

We will create two cabinets, a processor zone cabinet and a central cabinet which is presumably located near one or more switches. We will trunk the two cabinets together, then trunk the zone cabinet to a processor. Finally, we will route a switch-to-processor connection through the cabinets using a labeled fiber jumper.

### Create the Cabinets

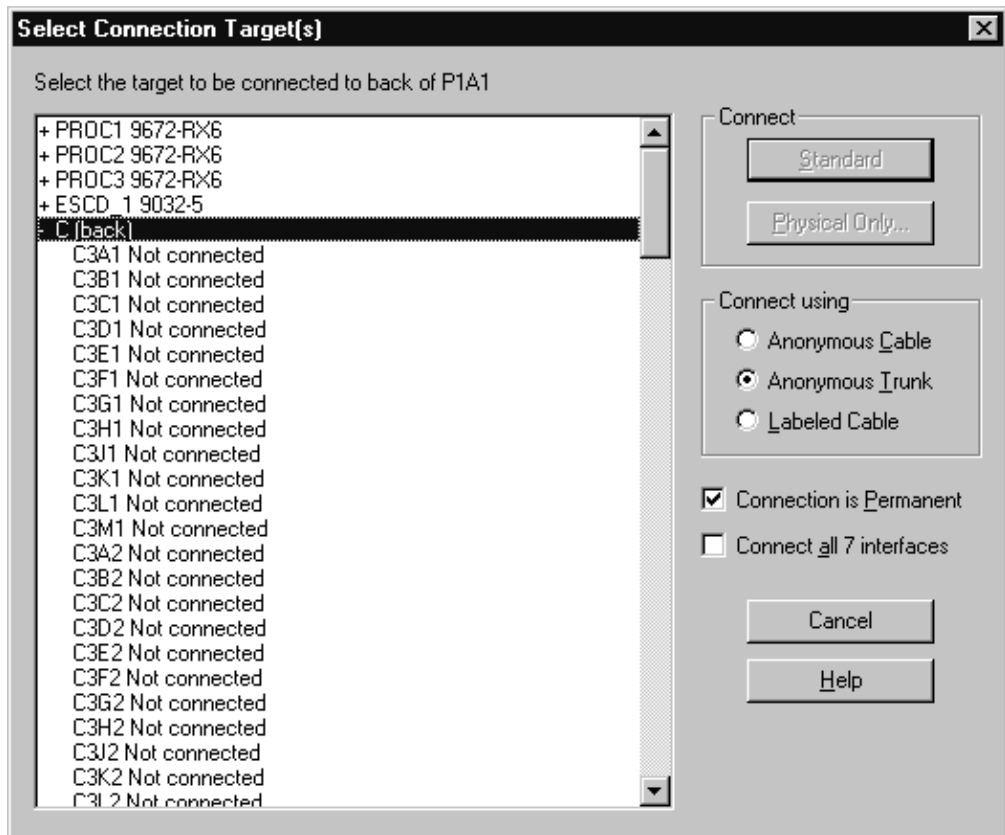
We will create the zone cabinet first.

1. Select **Create:Cabinet** from the menu. This opens the **Create Cabinet** dialog.
2. Select "IBM Zone Cabinet" for Model and enter "P" for the cabinet ID to denote "processor zone". Select "Near Processors" for the Suggested Graphical Position of Patchport. You can also enter a cabinet description and a serial number.
3. Click **OK**. The new cabinet appears on the right side of the diagram.
4. Now create the central cabinet with "IBM Main Distribution Frame" for Model, ID "C", and suggested graphical position "Central".

### Trunk the Two Cabinets Together

We will now connect the two cabinets back-to-back using a permanent trunk.

1. Edit the processor zone cabinet by either selecting **Edit:Cabinet** and choosing the cabinet from the list or by double-clicking on the cabinet in the diagram. This opens the **Cabinet** dialog.
2. Add a panel by clicking "Add" in the panel section. This opens the **Add Panels** dialog. Enter the required data in this dialog to obtain the requested panels.
3. Click the "Front" radio button in the View section of the **Cabinet** dialog. Select 7 patchports and click "Connect". This opens the **Select Connection Target(s)** dialog.
4. In the list box, double-click on the back-marked central cabinet. This expands the list, showing the backs of all patchports in that cabinet.



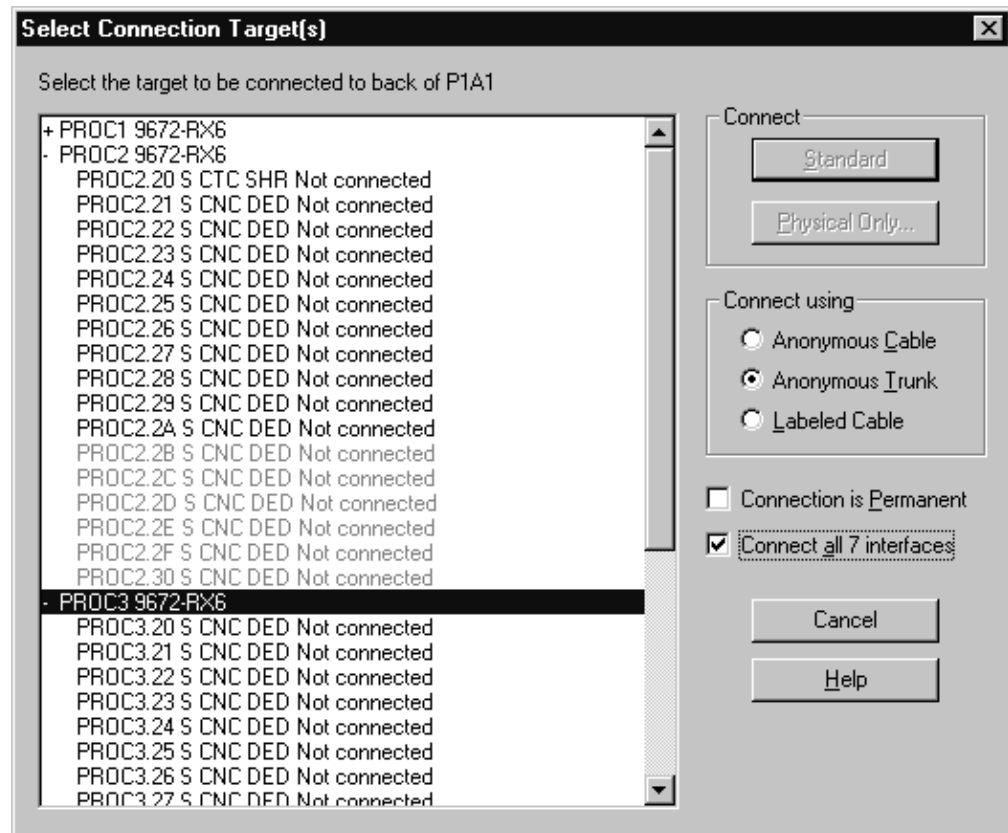
5. Select the first patchport, C3A1.
6. Check "Connect all 7 interfaces".
7. Select **Anonymous Trunk** and click **OK**.

The first 7 patchports of the two cabinets have now been trunked together.

## Trunk the Zone Cabinet to the Processor

We will now connect the Processor Panel to some CHPIDs on the processor, using an anonymous (unlabeled) permanent trunk.

You should now be in the **Cabinet** dialog. Change the radio button from "Front" to "Back" in the View section and click Connect. This opens the **Select Connection Target(s)** dialog.



1. In the list box, double-click on the processor you are connecting. This expands the list, showing all CHPIDs in the processor.
2. Find a sequence of 7 free CHPIDs and select the first one.
3. Click "Connect all 7 interfaces".
4. Select **Labeled Cable** and click **OK**. The **Assign Cable** dialog will be opened six times in sequence for you to assign labels to the individual lines of the trunk.

**Assign Cable**

Connection: PROC2.20 --- P1A1 ☐ Connection is Permanent

ID: TR0001/00 Type: Multi Mode Jumper db Loss A: N/A

Length: 60 db Loss B: N/A

Comment: Patchport - CHPID connection

Unused cables:

ID	Type	Length	Last use	Time of last use	Comment	Loss A	Loss B
mmf1015	MMJ	60	SYSB.62 --- ESCD_2.DE	2000-12-22 10:37:31	SYSB to ESCD-2	0.000	0.000
mmf1016	MMJ	60	SYSB.63 --- ESCD_2.E2	2000-12-22 10:37:26	SYSB to ESCD-2	0.000	0.000

5. Label each line with the same trunk designator followed by a "/" and the line number. E.g. TR0001/00", "TR0001/01", etc.
6. Click **OK** to return to the **Cabinet** dialog, where you can see that the patchports are now connected to the CHPIDs, as well as to the patchports in the other cabinet.

**Cabinet**

ID: P Description: IBM Zone Cabinet, Cabinet 1

Model: IBM Zone Cabinet

Serial Number: 0987654321 Suggested Graphical Position of Patchports: Near processors

Patchports for panel 1 "P1"

View: ☐ Front ☒ Back Panel size is 10X10 Patchports are sequenced row first

PROC2.20 B P1A1 C3A1	PROC2.21 B P1B1 C3B1	PROC2.22 B P1C1 C3C1	PROC2.23 B P1D1 C3D1	PROC2.24 B P1E1 C3E1	PROC2.25 B P1F1 C3F1
P1A2	P1B2	P1C2	P1D2	P1E2	P1F2
P1A3	P1B3	P1C3	P1D3	P1E3	P1F3
P1A4	P1B4	P1C4	P1D4	P1E4	P1F4
P1A5	P1B5	P1C5	P1D5	P1E5	P1F5

Panels: 1 2

Patchport detail: ☒ Show Front ☒ Show Entire Link ☐ Show Cables

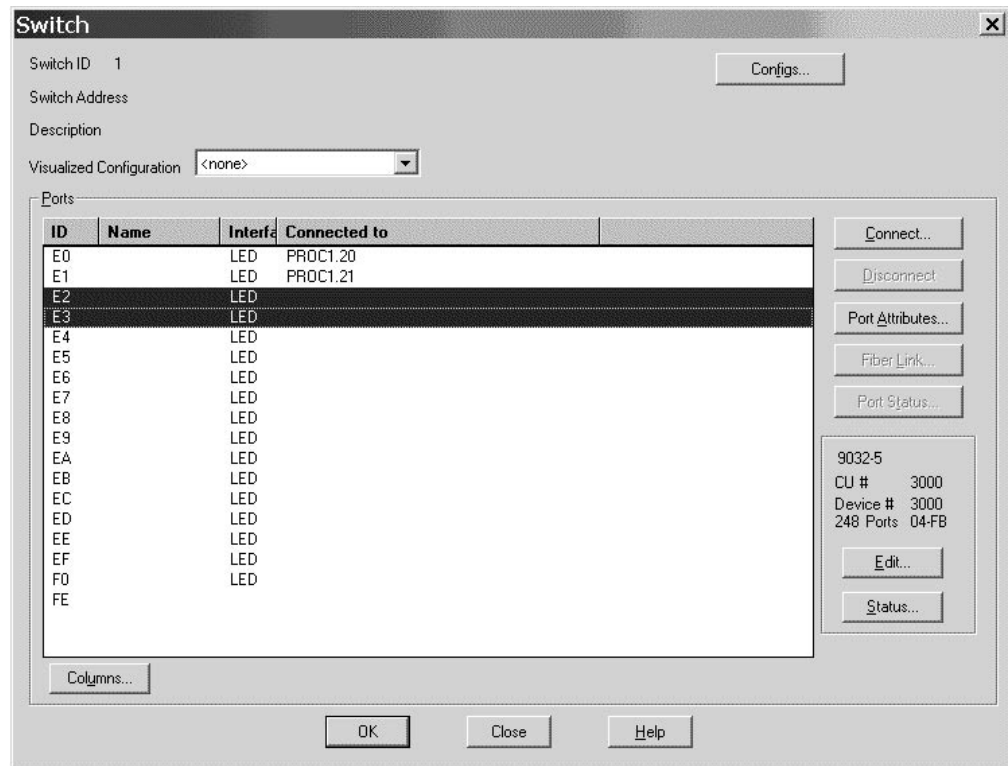
7. Click **OK** on all open dialogs to close them.

## Connect a Switch to CHPIDs Through the Patchport Cabinets

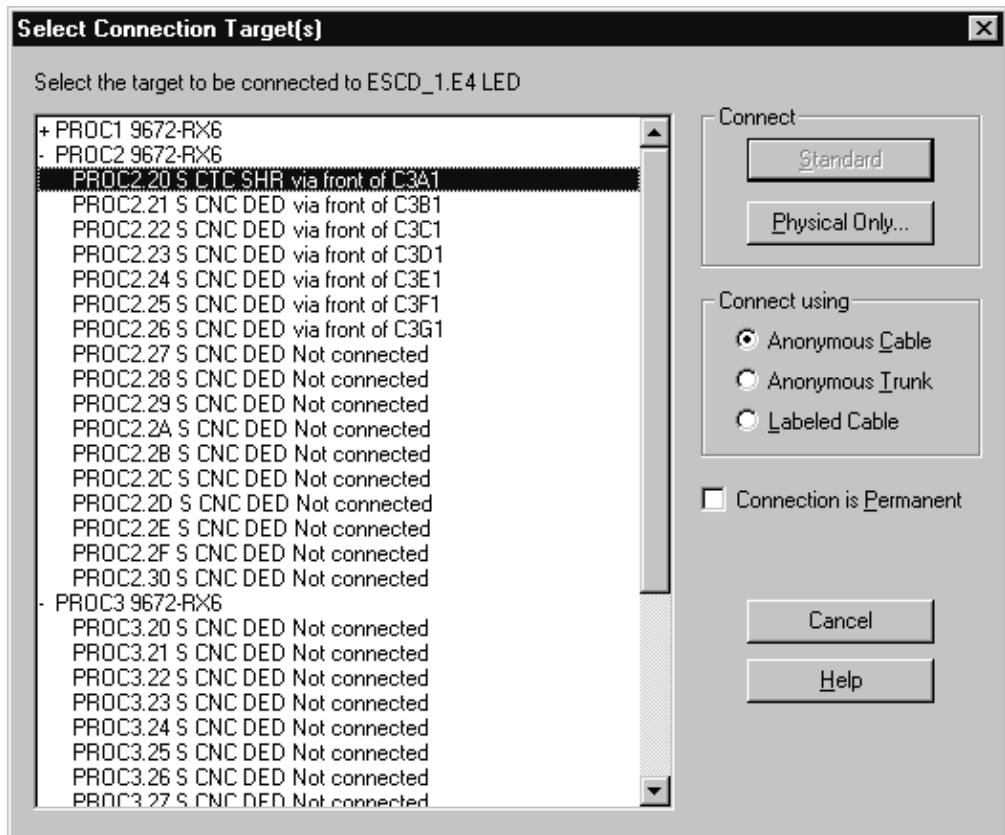
Permanent connections between pairs of patchports must be made before permanent connections between patchports and CHPIDs. It is also necessary to make all permanent (trunk) connections among patchports before adding those patchports to fiber links.

We will connect an existing switch port to one of the trunked CHPIDs. Although the CHPIDs are already connected to patchports in the cabinet, we will specify the CHPID as the connection target. The patchports will automatically be connected between the switch port and the CHPID.

1. Edit the switch by either selecting **Edit:Switch** and choosing the switch from the selection list or by double-clicking on the switch in the diagram. This opens the **Switch** dialog.



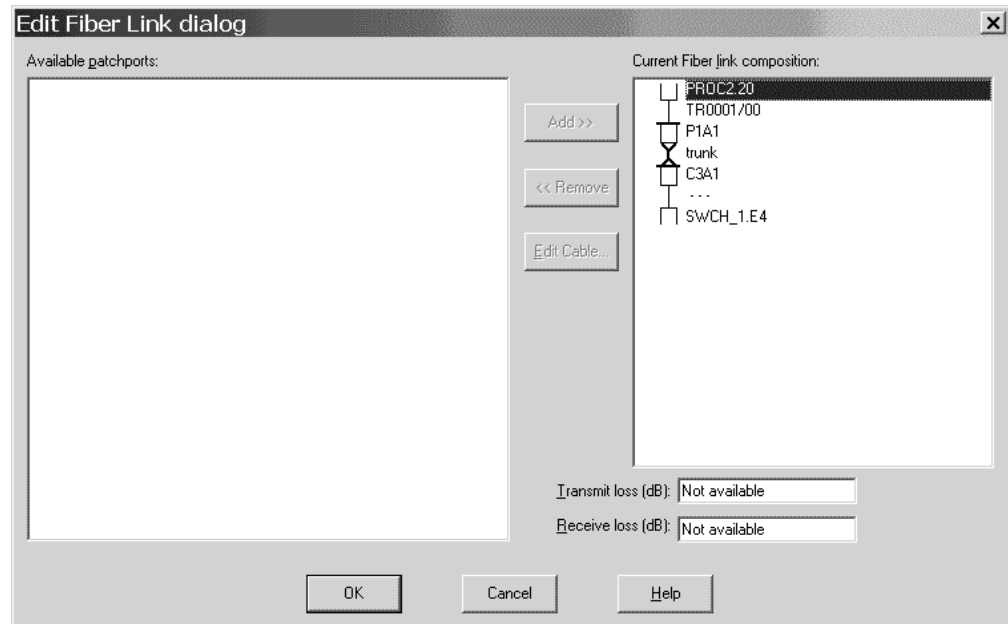
2. Select one of the free switch ports and click **Connect**. This opens the **Select Connection Target(s)** dialog.



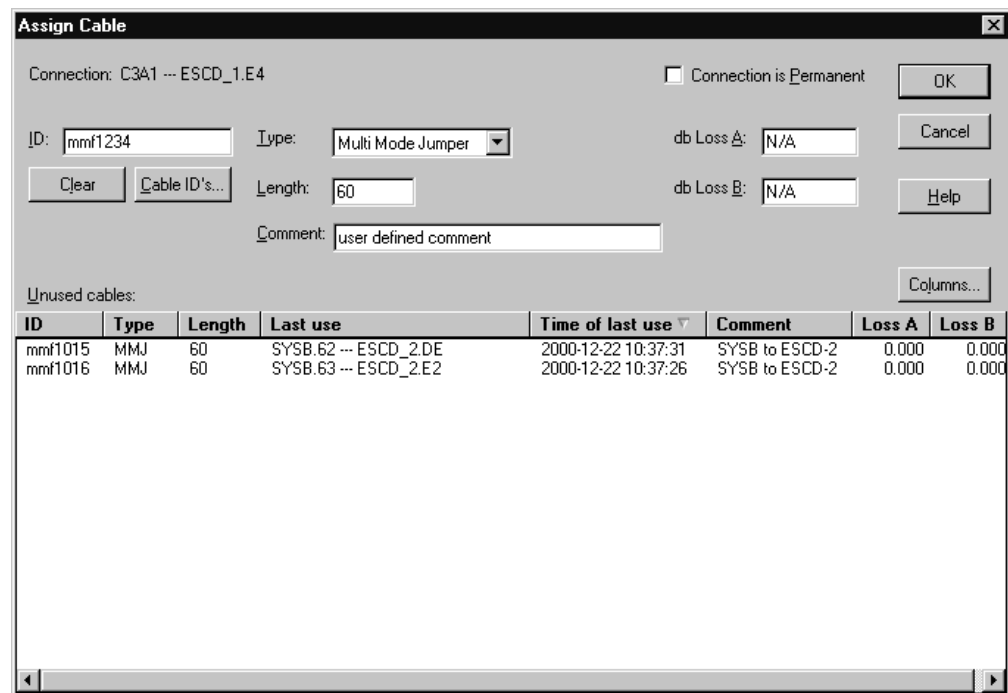
3. In the list box, double-click on the processor with the trunked CHPIDs. This expands the list, showing all CHPIDs in the processor.
4. Double-click on one of the trunked CHPIDs. The connection is made between the switch port and the CHPID.

## Assign a Cable to the New Connection

1. In the **Switch** dialog, select the newly connected switch port and click **Fiber Link**. This opens the **Edit Fiber Link** dialog which shows the composition of the fiber link in the box to the right.



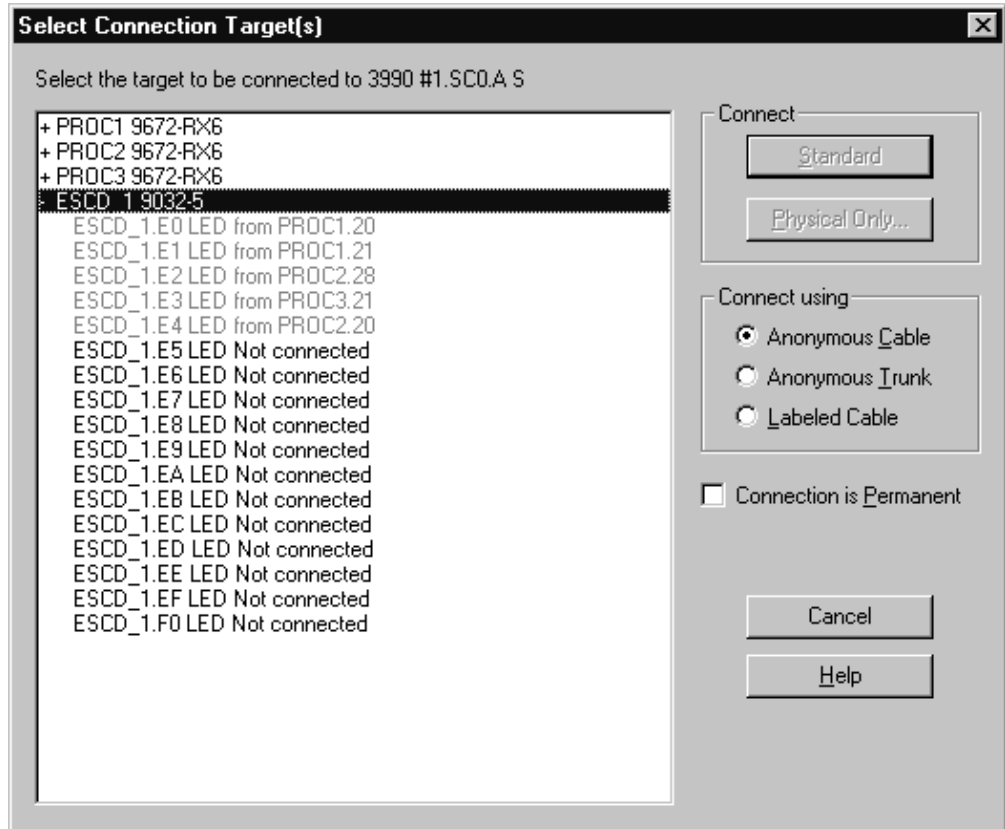
2. Select the “---” between the switch port and patchport C3A1 and click **Edit Cable**. This opens the **Assign Cable** dialog.



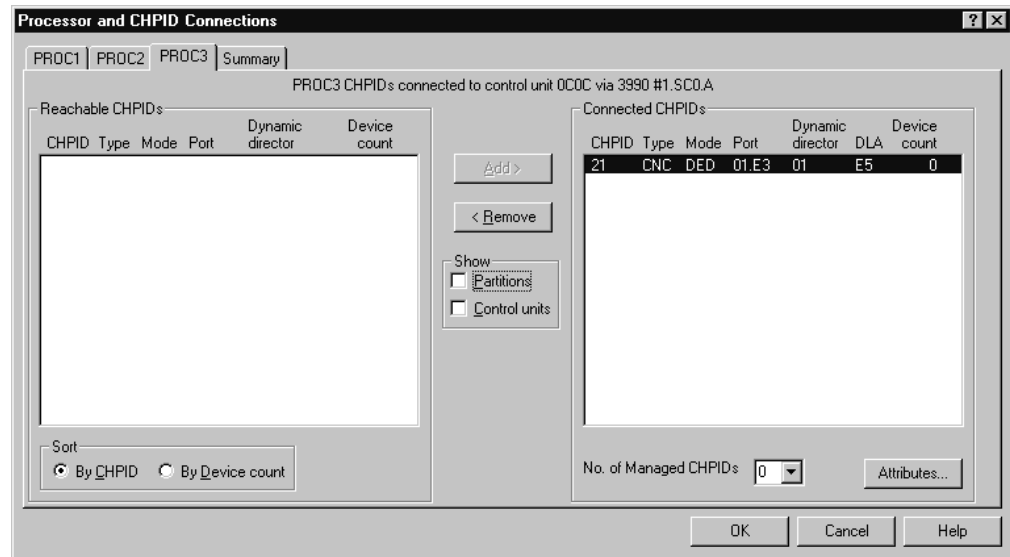
3. Fill in the cable's ID, type, and length, then click **OK**. The cable's new label now appears in the **Fiber link** dialog.
4. Click **OK** on all open dialogs to close them. The new connection between the switch and the CHPID through both patchports can be seen on the diagram.

## Connect a Controller to the CHPID via the Switch

1. Edit an existing controller by either selecting **Edit:Controller** and choosing the controller from the list or by double-clicking on the controller in the diagram. This opens the **Select controller...** dialog. Select a controller and click **OK**. This opens the **Controller** dialog.
2. Select a free channel interface to connect and click **Connect**. This opens the **Select Connection Target(s)** dialog.



3. Choose the switch that we trunked to a CHPID from the list and double-click it to expand it. This lists all of the installed ports in the new switch.
4. Select a port with no connection and click **Standard** in the **Connect** box.
5. Since we are connecting through a switch, the **Processor and CHPID Connections** dialog is opened for you to choose the CHPIDs to which the control unit will be defined.



6. Select the CHPID that we trunked to this switch and click **Add>>** to move this CHPID to the **Connected CHPIDs** list.
7. Click **OK**. The connection is now made and we are returned to the **Controller** dialog.
8. Click **OK** on all open dialogs to close them. The connection between the controller and the switch appears on the diagram. When the controller is selected, the full connection is highlighted from the controller through the switch and the patchports, to the CHPID.
9. Save your configuration file.

---

## Scenario IV – Configuration Changes for Installing a FICON Bridge Card in a 9032–5 ESCON Director

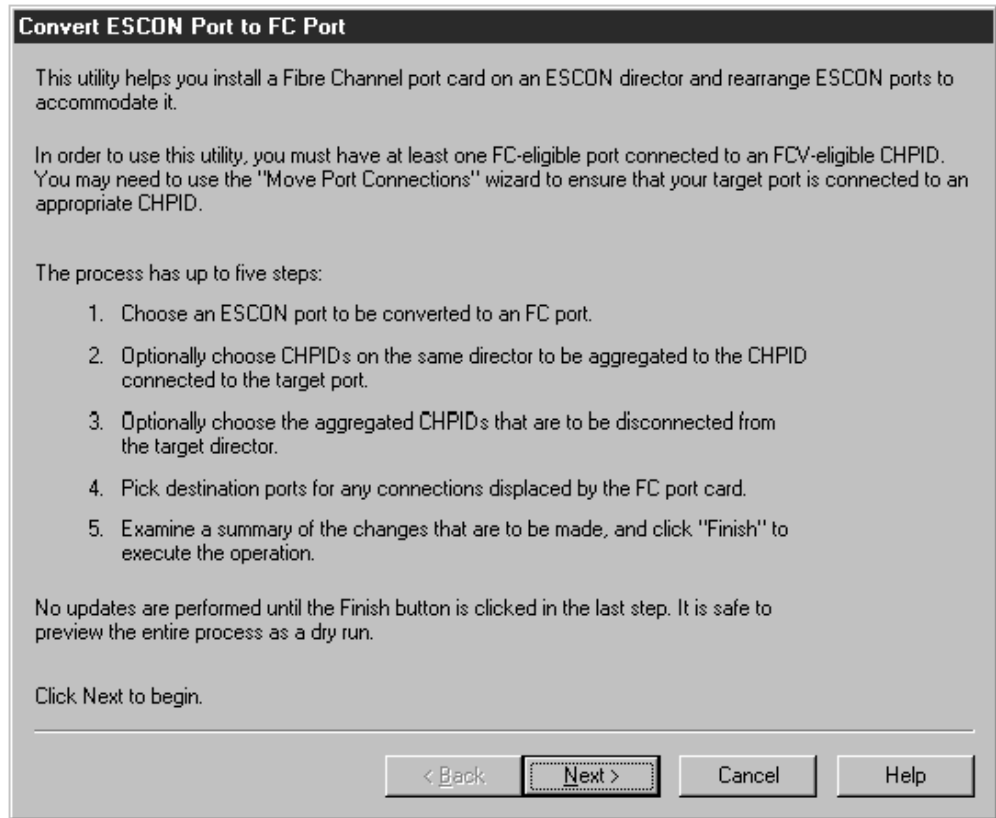
The new FICON Conversion Channels (FCVs), with their wider bandwidth compared to classical ESCON channels, allow connecting more I/O equipment to a single channel. To use the FCV channels, they must be connected to a FICON bridge card installed in a 9032-5 ESCON director. To install FCV channels and a FICON bridge card in an 9032-5 you must follow some configuration rules:

- FCV channels can only be installed in specific locations in the processor and have particular CHPID numbers depending on the processor type.
- FICON bridge cards can have only one port address (and link address), on a modulo 8 + 4 port address.
- The 7 consecutive subsequent port addresses of a FICON bridge port address are used by the FICON bridge card and cannot be used for other connections.

The FICON conversion utility can be used for adapting an IODF to use FCV channels. The following scenario shows an example of how an I/O configuration can easily be changed using the utility. The starting point in this scenario is a configuration in which a CNC CHPID D4 is connected to a port 74. CNC CHPID D7 is also connected to the ESCD. Three additional CHPIDs are connected to ports 75, 78, and 79. The objective of the configuration changes is to have a FICON bridge card at position 74, and CHPID D4 must be converted from CHPID type CNC to FCV. Also, all attached I/O equipment of CHPID D7 will be disconnected and reconnected to the FCV CHPID D4 (aggregation of CHPID D7 to D4) to make use of the wider bandwidth of the FCV channel. The original connection between ESCD port E0 and CHPID D7 will be disconnected (since this connection is no longer used). The connections between ports 75, 78, and 79 and their channels must be relocated to different positions on the director, since the original port addresses can no longer be used after installing a FICON Bridge card. Relocating the connections from 75, 78, and 79 to different positions using this utility will not affect the connectivity of the respective CHPIDs to their I/O equipment.

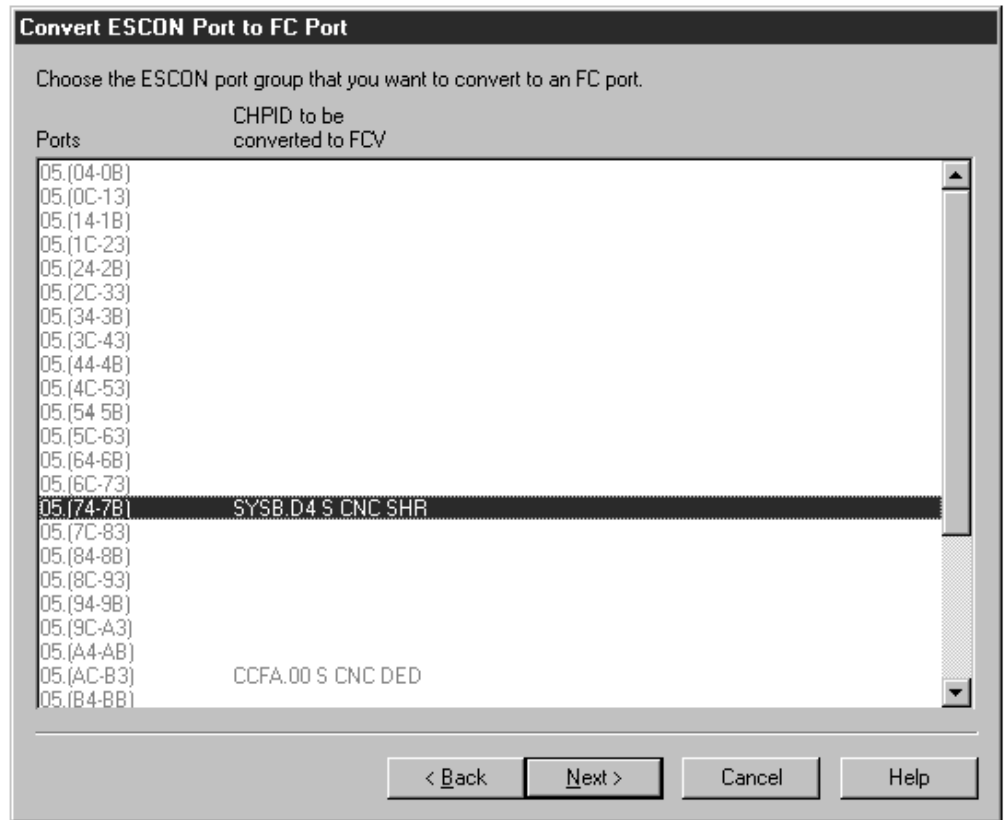
To perform the changes, proceed as follows:

1. Invoke the **Convert ESCON Port to FC...** utility from the **Utilities** menu.
2. The wizard will appear and explain the following steps.



Click the **Next >** button to continue.

3. A list of all possible ports that can be used to hold a FICON bridge card will be shown. The only selectable ports will be those with an appropriate port address (starting with 04 modulo 8 + 4 of 9032-5) and which are already connected to an FCV or to an FCV-eligible CHPID (e.g., a CHPID whose type can be changed to FCV). All ports that are not usable for a FICON bridge card are grayed out.



Select port 74 of director 05 connected to CHPID D4 of processor SYSB and click **Next >**.

4. In the following step, you have the chance to aggregate I/O equipment of other CHPIDs to CHPID D4. Select CHPID D7 of processor SYSB to be aggregated to D4 and click the **ADD >** button.

**Convert ESCON Port to FC Port**

Choose CHPIDs to be aggregated with SYSB.D4

CHPID	Type	Mode	Port	Dynamic director
SYSB.71	CTC	SHR	05.F3	05
Access: MVSPROD MVSTEST				
CU 0D01 (SCTC) Devices 0D00,8(BCTC), 0D08,8(SCTC)				
CU 0DA0 (SCTC) Devices 0DA0,8(BCTC), 0DA8,8(SCTC)				
SYSB.D7	CNC	SHR	05.E0	05
Access: MVSPROD MVSTEST				
CU 0241 (3990-3) Devices 0240,32(3390), 0260,32(3390)				
SYSB.D8	CNC	SHR	05.E4	05
Access: MVSPROD MVSTEST				
CU 0200 (3990-3) Devices 0200,32(3390), 0220,32(3390)				

View  
☒ Partitions  
☒ Control units

Add >

CHPIDs chosen for aggregation

CHPID	Type	Mode	Port	Dynamic director
SYSB.D4	CNC	SHR	05.74	05
Access: MVSPROD MVSTEST				
CU 0200 (3990-3) Devices 0200,32(3390), 0220,32(3390)				

Remove >

< Back   Next >   Cancel   Help

In the bottom part of the window you will see CHPIDs and their I/O equipment as it will be aggregated. Click **Next >** to continue.

5. In the following window, you can specify whether or not to disconnect the just selected CHPID for aggregation of D7 from its port of the ESCD.

**Convert ESCON Port to FC Port**

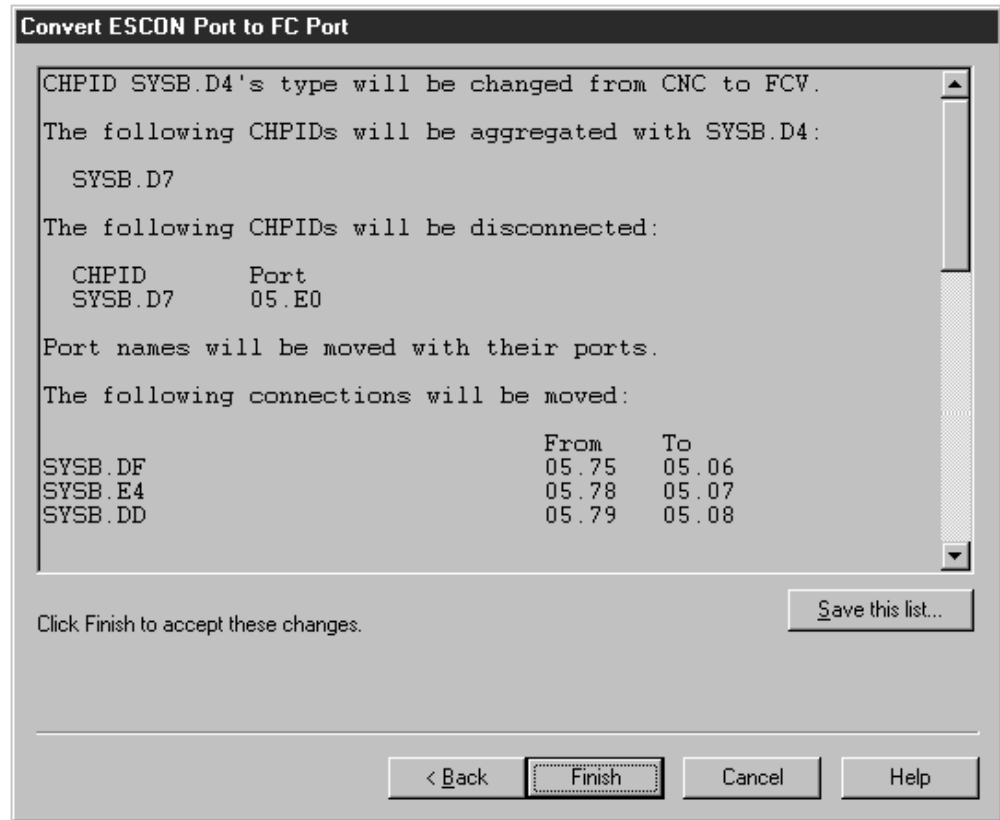
Check the aggregated CHPIDs that you would like to have disconnected from the target director after aggregation is complete.

CHPID	Current port connection	Disconnect
SYSB.D7	05.E0 LED	<input checked="" type="checkbox"/>

< Back   Next >   Cancel   Help

Click **Next >** to continue to displace port connections.

6. You can now determine where to move port connections from connections to port addresses which must be freed, since they follow directly after the port address of the FICON bridge port address. For port address 75 connected to CHPID DF of processor SYSB, specify the new port address 06. For port address 78 connected to CHPID EA of processor SYSB, specify the new port address 07. For 79 connected to CHPID DD of processor SYSB, specify the new port address 08. You can use the prompting capability to check for free port addresses. After selecting new port addresses for connections that must be displaced, click **Next >** to see the final summary.
7. You will now see the final summary of all changes to the configuration. This summary lists all affected objects including the changes to be performed to the IODF. Scroll down to examine the complete list, which will contain information such as:
  - CHPID that will be the FCV
  - Aggregated CHPIDs
  - Possibly disconnected CHPIDs
  - Control unit connections moved
  - Port connections moved
  - Uninstalled ports



Scroll down to see the complete summary. You can save the summary to a file to store the list of changes for archive purposes or to use the list as a worksheet for guidance for changing the cable connections directly at the hardware box. As long as you do not click the **Finish** button, no changes are written to the HCM configuration and no changes are made to the IODF. It is still possible to refrain from performing the specified changes. Click the **Finish** button to allow the wizard to complete. Confirm the configuration changes after you have examined all the listed items in the summary and agree with it.

If you save this summary to a file, you will have the following list of configuration changes:

- CHPID SYSB.D4's type will be changed from CNC to FCV.
- The following CHPIDs will be aggregated with SYSB.D4:  
SYSB.D7
- The following CHPIDs will be disconnected:  

CHPID	Port
SYSB.D7	05.E0
- Port names will be moved with their ports.
- The following connections will be moved:  

	From	To
SYSB.DF	05.75	05.06
SYSB.E4	05.78	05.07
SYSB.DD	05.79	05.08
- The IODF will be updated as follows:  

CHPID Type changes	From	To
SYSB.D4	CNC	FCV
- The following control unit connections will be moved:

	From	To
CU 0241 (3990-3)	SYSB.D7	SYSB.D4

- Any devices using a source CHPID as the preferred CHPID will be updated to use the target CHPID.

- The following port connections will be moved:

	From	To
SYSB.D7	05.E0	-----
SYSB.DD	05.79	05.08
SYSB.DF	05.75	05.06
SYSB.E4	05.78	05.07

- The switch configurations on director 05 (if any) will be updated as required.
- The following ports will be uninstalled:

05.75  
05.76  
05.77  
05.78  
05.79  
05.7A  
05.7B

## Scenario V – Establish a PPRC Connection consisting of several PPRC Links

PPRC (peer-to-peer remote copy) connections are direct connections between DASD controller subsystems that are used primarily to provide a hot standby capability. These connections can be point-to-point from one DASD controller to another, or they may pass through switches, just as connections from CHPIDs to control units can. Note that HCM provides methods to physically document PPRC connections, and to export PPRC connection information into CESTPATH command and GEOPARM control statement format for further use on the host. HCM does not validate whether the entered PPRC links are valid links in a real configuration, but HCM only provides documentation for this type of connections. In this scenario, we will set up a PPRC connection that consists of several single PPRC links. To demonstrate what you can do with this utility, some of the PPRC links will directly connect two subsystems with each other, while other PPRC links involve a director. Let us consider a basic configuration where we have the following I/O objects already defined:

- A FICON director, type 2032, Id=05
- An IBM Enterprise Storage Server (ESS) DASD subsystem #1, consisting of control units 3000 and 3010, both having SSID 3000 specified, that has connections as follows:
  - Interface 04.A[0C] connected to director 05.40
  - Interface 04.B[0D] connected to director 05.41
- A second IBM Enterprise Storage Server (ESS) DASD subsystem #2, consisting of control units 4000 and 4010, both having SSID 4000 specified, that has connections as follows:
  - Interface 04.A[0C] connected to director 05.50
  - Interface 04.B[0D] connected to director 05.51
- Devices of type 3390 which are connected to the control units as follows: device range 3000,32 connected to control units 3000 and 3010, and device range 4000,32 connected to control units 4000 and 4010

To establish a PPRC connection, proceed as follows:

1. Edit the subsystem #1 by either selecting **Edit:Controller** and choosing the controller from the list or by double-clicking on the controller in the diagram. This opens the **Controller** dialog.
2. Select interface 12.A[8C] and click **Connect**. This opens the **Select Connection Target(s)** dialog.
3. Choose interface 12.A[8C] of DASD subsystem #2 as target, and click **Physical only** to connect both interfaces.
4. Repeat steps 2 and 3, now connecting the interfaces 12.B[8D] of both DASD subsystems #1 and #2 with each other. Click **Close** to leave the **Controller** dialog.
5. Select **Create: PPRC Connection**. This opens the **Create PPRC Connection** dialog. This utility will guide you through 4 pages on which you can specify certain information needed to create a PPRC connection.
6. Click on the first entry of the list (SSID 3000) in order to select the primary (source) subsystem of the PPRC connection, and click **Next**. This will show page two of the **Create PPRC Connection** dialog.

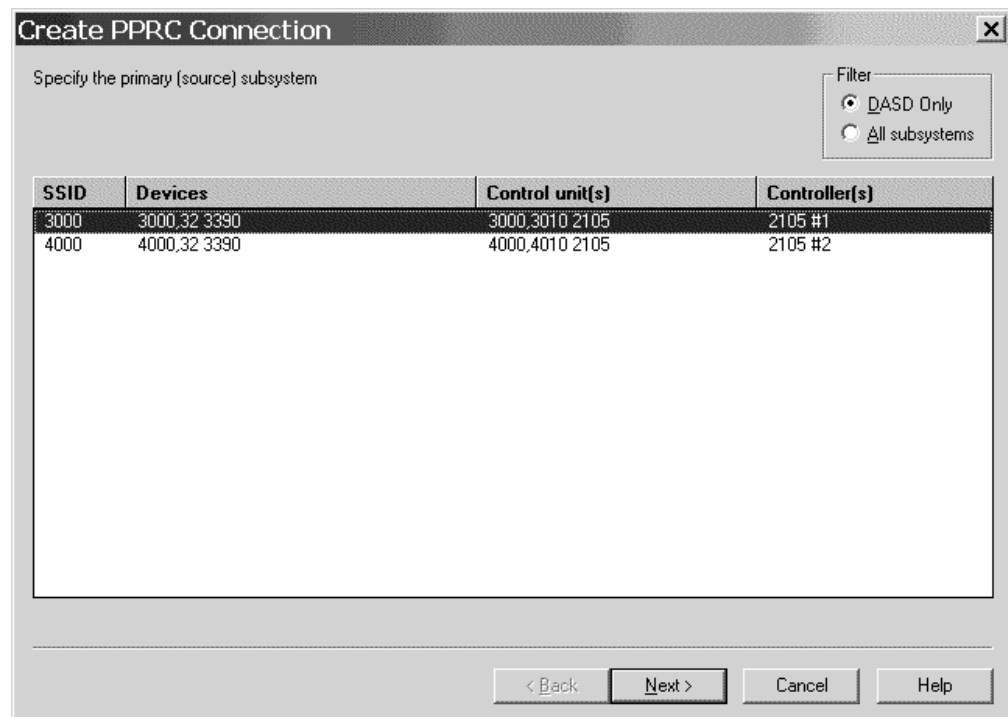


Figure 134. Create PPRC Connection (1)

7. Click on the second entry of the list (SSID 4000) in order to select the secondary (target) subsystem of the PPRC connection, and click again **Next** which will lead you to page 3 of the utility.
8. We want to create a PPRC connection consisting of four single PPRC links. Therefore, click the **More** button three times to obtain altogether 4 possible entries for a source and a target interface. As source interfaces on the left side of the dialog, select the interfaces 4.A[0C], 4.B[0D], 12.A[8C], 12.B[8D] which are interfaces of the DASD subsystem #1. As the latter two interfaces are directly connected to interfaces of DASD subsystem #2, HCM will automatically fill the entries on the right side (target interfaces). Your **Create PPRC Connection** dialog should now look similar to the following:

**Create PPRC Connection**

Choose the interfaces that will be used to connect the two subsystems

Source interface from SSID 3000	Target interface to SSID 4000
2105 #1.4.A[0C] S from SWCH_5.40	
2105 #1.4.B[0D] S from SWCH_5.41	
2105 #1.12.A[8C] S from 2105 #2.12.A[8C]	2105 #2.12.A[8C] S from 2105 #1.12.A[8C]
2105 #1.12.B[8D] S from 2105 #2.12.B[8D]	2105 #2.12.B[8D] S from 2105 #1.12.B[8D]

More Less

< Back Next > Cancel Help

Figure 135. Create PPRC Connection (2)

Select the target interfaces 4.A[0C] and 4.B[0D] of DASD subsystem #2 to finish specifying the interfaces for both the source and the target subsystem.

**Create PPRC Connection**

Choose the interfaces that will be used to connect the two subsystems

Source interface from SSID 3000	Target interface to SSID 4000
2105 #1.4.A[0C] S from SWCH_5.40	2105 #2.4.A[0C] S from SWCH_5.50
2105 #1.4.B[0D] S from SWCH_5.41	2105 #2.4.B[0D] S from SWCH_5.51
2105 #1.12.A[8C] S from 2105 #2.12.A[8C]	2105 #2.12.A[8C] S from 2105 #1.12.A[8C]
2105 #1.12.B[8D] S from 2105 #2.12.B[8D]	2105 #2.12.B[8D] S from 2105 #1.12.B[8D]

More Less

< Back Next > Cancel Help

Figure 136. Create PPRC Connection (3)

Click **Next** which will show the last page of the utility.

9. Specify the parameters as needed, and finally click **Finish** to complete setting up the PPRC connection.

Create PPRC Connection

Fill in the remaining parameters for each link in the connection

Interfaces	Source control unit	Dynamic switch	Link address	CUADD	Target control unit
2105 #1.4.A[0C] S to 2105 #2.4.A[0C] S	3000	SWCH_5	50		4000
2105 #1.4.B[0D] S to 2105 #2.4.B[0D] S	3000	SWCH_5	51		4000
2105 #1.12.A[8C] S to 2105 #2.12.A[8C] S	3000				4000
2105 #1.12.B[8D] S to 2105 #2.12.B[8D] S	3000				4000

Description

First PPRC Connection

DEVN (for CESTPATH commands)

3000

< Back

Finish

Cancel

Help

Figure 137. Create PPRC Connection (4)

You have now defined a new PPRC connection consisting of 4 single PPRC links. Using **Locate:PPRC Connection**, you can locate and highlight the PPRC connection in the diagram at any time.



---

## Chapter 14. HCD-Only Tasks

The following tasks cannot be carried out using HCM. They must be done using HCD on the host.

---

### Defining and Viewing Configuration Data

You can use HCD to define and view configuration data for the following tasks.

#### Adding Similar Objects to a Configuration

You can use the **Add like** function of HCD to add a new object, that has a definition similar to a previously added object. For devices and control units, this function copies also the defined relations.

#### Copying Configurations and Merging IODFs

The existing **Repeat** function in HCD allows you to copy a selected object together with its dependent objects and I/O attachments not only within the same IODF but also to another IODF. This is useful if you want to consolidate configuration data from different IODFs in one IODF.

#### Transferring Partition Configurations

Use the **Transfer (move) partition configs** function to transfer control units and devices attached to a channel path from one partition to another within the same IODF. In contrast to the **Repeat** function, you do not copy the partition and channel paths, but move the attached control units and devices to another partition, possibly in another processor.

#### Migrating Existing Input Data Sets

Use HCD to migrate existing configuration data that was defined in IOCP, MVSCP, and HCPRIO input data sets to an IODF or update the IODF via control statements.

#### IODF Import/Export

You have to use HCD to send an IODF, and optionally its activity log file, to another (local or remote) system. You can export and import IODFs between different HCD releases.

#### Upgrade an IODF from an Earlier Version of HCD

When you want to use an MVS/ESA 4.2 or 4.3 IODF with a higher HCD release, you first have to upgrade the IODF into the new format before using it.

#### Comparing IODFs

You can use the HCD *Compare IODFs* function to compare two IODFs and report the differences between them. You can restrict the reports to certain views of the IODF:

- The processor view shows differences in the properties of partitions, channel paths, control units, and devices.
- The switch view shows differences in the properties of switches and switch configurations.

- The operating system view shows differences in device parameters, in features, in EDTs, in esoterics, in generics defined for EDTs, and consoles.

## Printing Reports

You can generate the following configuration reports about data in an IODF:

### I/O Path Report

Shows the physically sensed I/O paths (with physical types) of the active system compared with the logical definitions of the paths (also the object types) of a specific IODF.

### Supported Hardware Report

Contains information about the processors, control units and devices supported in your installation. This report is generated directly from the processor support modules and UIMs and reflects the latest support levels installed.

### I/O Definition Reference

Contains a description of the parameters to define the device to the Channel Subsystem, and a description of the parameters and features to define the device to the MVS operating system. This report is generated directly from the UIMs and reflects the latest UIM levels installed.

## Querying Supported Hardware and Installed UIMs

You can query supported processors, switches, control units, devices, and installed UIMs.

## Viewing and Printing the Activity Log

Use HCD to either view or print the activity log. Select *Print or compare configuration data* from the HCD primary task selection panel and then either the *View the activity log* or *Print the activity log* option.

## Support of Large IODFs

Within large installations IODFs describing the entire I/O configuration may become too big for an effective management. To remedy this problem, while preserving the benefits of keeping a single repository for all I/O definitions, HCD can build subset IODFs based on configuration packages from a centrally administered master IODF. Configuration packages define subsets of the master IODF, which allows selective distribution of I/O data to target systems, while keeping the processor token in sync. Configuration packages also allow configuration changes made at a remote system to be merged back into the master IODF.

---

## Activating and Processing Configuration Data

You can use HCD to activate and process configuration data for the following tasks.

### Building IOCDSs

You have to use HCD to build an IOCDS from a production IODF. Processors may have varying numbers of IOCDSs. One IOCDS is used at POR time to make the configuration data known to the channel subsystem.

HCD allows you to build an IOCDS for processors that do not have an SNA address defined as well as for processors with an SNA address configured in an S/390 microprocessor cluster and controlled by the Hardware Management Console. You can do the following:

- Display the IOCDS status
- Write a new IOCDS
- Switch IOCDS to become the active one for the next POR
- Enable/disable the write protection of the IOCDS (only for S/390 microprocessor cluster)

## Managing IPL Attributes

With HCD you can get a list of all CPCs that are configured in an S/390 microprocessor cluster and controlled by the Hardware Management Console. You can use this list to do the following:

- Display the IPLADDR and IPLPARM attribute values of the last and for the next IPL
- Modify IPLADDR and IPLPARM attribute parameters to be used for next IPL

## Dynamic Activate

HCD allows you to activate your configuration dynamically, that is to change a currently active configuration without the need to POR or IPL your system again.

You can do this for local processors HCD is running on as well as for systems that are configured in a sysplex. You can:

- Activate software configuration changes only
- Activate software and hardware configuration changes
- Activate a configuration sysplex wide
- Switch IOCDS for the next POR

## Build Configuration Data Sets

With HCD you can build configuration data sets for IOCP, JES3 initialization stream checker, and HCPRIO. You can also generate control statements for any OS configuration and switch configuration defined.

## Building and Processing CONFIGxx Members

HCD allows to build individual CONFIGxx members from a production IODF. Existing CONFIGxx members can be updated or replaced.

For systems which are members of a sysplex, CONFIGxx members can be verified against selected systems. Responses are displayed in a message list.



---

## Chapter 15. Importing and Exporting Data

The HCM Import and Export facility allows you to exchange data between your non-HCM processes, applications and data bases and the configuration data of HCM. The import and export data format used by HCM is designed to be compatible with relational databases. It is conceptually organized as tables, and the data exchange is done via data stored in tables as text files.

For more information on the data format, see “Data Format for Importing and Exporting”. For a list of tables that are available in HCM, see “Table Summary” on page 299.

With the **Import Data** function you can use existing physical configuration data of your non-HCM application to update existing configuration data in HCM as well as to setup a new configuration file for HCM. Imported data overwrites existing HCM configuration data. In addition, import provides a method to build a configuration from the combination of a text file and an IODF.

The import function performs the following types of actions:

- Creating physical objects
- If necessary, resynchronizing the configuration file and the IODF
- Updating descriptive fields in both the configuration file and the IODF
- Creating or changing physical and some logical connectivity

With the **Export Data** function you can use configuration data of the HCM work and production files for your non-HCM applications and databases (for example, asset management). HCM configuration data can be stored in your external database for example, to create reports tailored to your needs. Or, you can create a list of devices including its VOLSERS.

### Notes:

1. Not all IODF data is exported.
2. Not all data which is exported can be imported to update the configuration.
3. When you are exporting data from HCM, the export file does not contain the complete IODF information. For example, no logical data for control unit - processor connection. However, all physical objects and physical connections are contained in the export file.

### Tip

For ease of use if you have huge non-HCM configuration data, you can write a program (for example with REXX or C) to extract data from the tables you have exported with HCM and convert these data into a format that you can use for your applications. Or you can write a program which creates tables for the HCM format from your existing data for import.

---

## Data Format for Importing and Exporting

The import and export data are organized in tables. Each line of text in the table corresponds to a row of data in a database table or in a text file.

Each table type corresponds to an object that appears in an HCM diagram. Every line of text is processed. The tables contain a header line (the column definition record) with column names that describe the subsequent rows, the data records. A data record always begins with the table name followed by fields with data values. See also “Record Structure”.

HCM uses the first column (table name) and the second column (column name which in most cases is the object ID) to identify an object in the configuration. If the physical object does not exist, it is created. Logical objects cannot be created. Subsequent columns are used to update data values in the object. If an existing object is not mentioned in the import file, it remains unchanged in the configuration. This allows the import file to contain a subset of the objects in the configuration. Therefore, it is not possible to delete an object via the Import facility.

Some IODF objects are included in the import data format so that they can be properly placed within physical objects and that fields like descriptions and serial numbers can be updated. Furthermore, these records include a number of fields that will be ignored during the import operation. These fields are exported because they are useful for reports, but cannot be used as input except through HCM’s user interface because they require extensive validation.

**Example for a processor table:**

```
"PROC","ID","Short Name","Model","Description","Serial Number" 1
"PROC","PROC1","P1","9021-822","Main Processor","1234569021"      2
"PROC","PROC2","P2","3090-600S","Old Processor","6543213090"      3
```

- 1 header line (column definition record)
- 2 and 3 data record

**File Structure**

The HCM Import and Export facility works with multiple files, one for each table. All files must be in the same PWS directory. The filenames are fixed 8 character table names. For a summary of the table names and for detailed table information, see “Table Summary” on page 299 and “Detailed Table Formats” on page 301.

With the **Import Data** function, you can read multiple import files from a directory. For import-only, you can also combine one or more tables into a single file. Blank lines are not tolerated in files being imported. They result in the same error message as if column one of the line contained an unrecognized table name.

During export with the **Export Data** function, you are asked for the directory where the data tables should be created. Export writes each table in one file for the specified directory.

**Record Structure**

Every row in a table represents one record. The first row of each table file is the column definition record (header line) which contains the column names. The column definition record defines the structure of the subsequent rows. The subsequent rows are the data records.

Each record contains several columns. Columns are separated with a character of your choice, for example, a comma or a tab. In this document a comma is used as a separator.

Compound names, such as partition names which are constructed from the processor name and the partition name are separated by a character of your choice, for example, a dot or a slash. In this document, a slash "/" is used as a separator. For example, PROC1/PART1 could also be PROC1.PART1.

The first column of each data record contains the table name, the second column contains the column name (in most cases it is the object ID) to identify a particular row. Subsequent columns contain the data for the description values of the table row.

For the import operation, it is required that each table starts with a column definition record. For the export operation, the column definition record is created by default, but you can suppress this behavior.

On import, each table can contain a subset of the columns in the table. The following examples could be used to update the description field of the processor (for example, PROC.TXT) and partition (for example, PART.TXT) tables, leaving all other values unchanged.

**Example to update a processor table:**

```
"PROC" 1, "ID" 2, "Description" 3
"PROC", "PROC1", "Main processor" 4
```

**Example to update a partition table:**

```
"PART" 1, "ID" 2, "Description" 3
"PART", "PROC1/LPAR1", "Test Partition" 4
"PART", "PROC1/LPAR2", "Production" 4
```

- 1** table name
- 2** column name (object ID)
- 3** column name (for example, description)
- 4** record data

The first reference to the table type must be the column definitions record. The column names are not processed in a case-sensitive way by HCM. If you read exported files using programs other than HCM, ensure that the programs are not case-sensitive when processing the table column names (column definition record).

The records for a particular table need not be contiguous in the input stream. For example, all column definition records (header lines) can be at the start of a file containing several tables. See the following examples of some possible ways your data can look like in a file containing several tables.

All column definition records appear at the beginning of the file:

```
"PROC", "ID", "Description"
"PART", "ID", "Description"
"PROC", "PROC1", "Main processor"
"PART", "PROC1/LPAR1", "Test Partition"
"PART", "PROC1/LPAR2", "Production"
```

The records can also appear in random order, as long as the column definition record precedes the record data:

```
"PART", "ID", "Description"
"PART", "PROC1/LPAR1", "Test Partition"
"PROC", "ID", "Description"
"PROC", "PROC1", "Main processor"
"PART", "PROC1/LPAR2", "Production"
```

or, more likely:

```
"PROC", "ID", "Description"  
"PROC", "PROC1", "Main processor"  
"PART", "ID", "Description"  
"PART", "PROC1/LPAR1", "Test Partition"  
"PART", "PROC1/LPAR2", "Production"
```

There must be only one column definition record for each table. Once the column definition records are known, subsequent column definition records are interpreted as data just like any other record.

An error message is issued by HCM if it encounters two or more records referring to the same object, but processing continues. For a given object, only the first record referring to it will be processed, all subsequent ones will be ignored.

## Column Formats

HCM recognizes six types of data columns:

**Text** Text fields are free-format fields of a predefined length and can contain any sequence of keyboard characters. The maximum length of the text varies with each column. The text can contain imbedded spaces as well as characters that are used as separators. If you use, for example, a comma as a separator, you need to enclose it in double quotes (the usual quote used in prose, for example, "A, and B"), or single quotes (the apostrophe character, for example, 'C, and D'). Use "" within a doubly quoted string to embed the double-quote character - "He said ""Hello"".". Single quotes can be used similarly, when single quotes are used to enclose the entire string. The Export function encloses text fields in double quotes.

Text fields are case sensitive. Fields which update IODF data must be entered in the appropriate case for the IODF field.

The maximum length of a text field is 254 characters.

**Note:** As HCM Version 1.1.0 allows 255 character user fields, the last character may be truncated on export. A warning message is generated in such cases.

When updating existing records, a text field updates the configuration even if the field is all blanks or empty. Blank or empty is a valid value for a text field. If the entire column is not present in the input file, the field will be left unchanged.

### Boolean (Bool)

These are fields with a Yes or No value. Accepted values in these fields are Yes, No, Y, N, 1, and 0 in upper or lower case.

A value enclosed in single or double quotes is also accepted although there is no need to do this. When updating existing records, a blank or empty Boolean field has no effect.

### Numeric (Num)

Sequence of digits. Where appropriate, definitions of these columns will indicate acceptable ranges for these values. A value enclosed in single or double quotes is also accepted although there is no need to do this.

When updating existing records, a blank or empty Numeric field has no effect.

**Hex** Sequence of hexadecimal digits (0..9, A..F). The field is checked that it is a

valid hexadecimal number. Where appropriate, definitions of these columns indicate acceptable ranges for these values.

A value enclosed in single or double quotes is also accepted although there is no need to do this. The processing of hex digits greater than 9 is not case sensitive, so an import accepts a..f, though an export produces A..F.

When updating existing records, a blank or empty Hex field has no effect.

**Float** Any floating point number which follows this generic format can be imported:

[whitespace] [sign] [ddd] [.] [ddd] [e|E[sign]ddd]

Where appropriate, definitions of these columns indicate acceptable ranges for these values.

A value enclosed in single or double quotes is also accepted although there is no need to do this.

When updating existing records, a blank or empty Float field has no effect.

On export, floats are expressed in this compatible format which avoids the use of exponential notation, with leading and trailing zeroes removed:

[ddd] [.] [ddd]

#### **Enumerated (Enum)**

These are fields that accept a single value from a predefined set of text values. As an example, physical ports on an ESCON director may be either "LED" or "Laser". Values are not case sensitive, i.e. Laser and LASER are equivalent.

A value enclosed in single or double quotes is also accepted although there is no need to do this.

When updating existing records, a blank or empty Enumerated field has no effect.

In all cases, leading and trailing spaces are ignored.

## **Hierarchical Object Keys**

Where applicable, the object keys in the tables are structured in a hierarchical manner. This has the following benefits:

- The key itself, with the object type implied by the table containing the data, is sufficient to completely identify the object without reference to other tables to obtain the contained-in relationships. This simplifies reporting.
- A sorted list of table rows groups related objects together. For example, the Controller Channel Interface (CCI) table would contain the following object keys:

3990 #12/SC0/A  
3990 #12/SC0/B  
3990 #12/SC1/A  
3990 #12/SC1/B

- A database query could collect items using keys containing wild cards. For example, from the Controller Channel Interface (CCI) table:

3990 #12/*	All channel interfaces on 3990 #12
3990 #12/SC0/*	All channel interfaces on segment SC0 of 3990 #12

## Unique Key

All objects which can be mentioned as a source or target in the CONNECT or LOGLINK tables have a unique key field. This field is for export-only and contains a combination of the table name and the object ID. This is necessary since the object ID by itself is often not sufficient to uniquely identify the object. For example, A1/F2 could be CHPID F2 of processor A1, or it could be port F2 of switch A1.

In the case of patchports and daisy-chained parallel interfaces, the source or target fields in the CONNECT table are qualified with a suffix indicating exactly which of the multiple interfaces is being referred to. (See discussion under the Table 30 on page 325). In these cases, a simple concatenation of the table name and the object ID is not sufficient to use as a key. Using the explicit unique key for database joins, and the source and target fields as the descriptive text, works well and is easy to describe to the database platform when using the tables exported by HCM.

## Future Compatibility and Extensibility

The file format is flexible to easily accommodate additional tables and/or fields in the future. Older files without the new tables and fields would still be importable by later versions of HCM.

---

## Working with the Import and Export Function

To import and export your configuration data from text files to your configuration, open **Import Data...** or **Export Data...** from the **File** menu.

Use a text editor that processes more than 80 characters per line. Or you can use a spreadsheet program, for example, Lotus 1-2-3.

For more information on the data formats, table names, and table details, refer to "Data Format for Importing and Exporting" on page 283, "Table Summary" on page 299, and "Detailed Table Formats" on page 301.

## Importing Data

With the import function you can populate data of non-HCM applications or processes into HCM to do the following:

- Setup a new HCM configuration file with existing physical data.

To do this, select **Create a new file** in the **Choose HCM file for Import** dialog. If you import data into an empty file, you are doing an initial setup of the HCM configuration file. For example, you are importing infrastructure data. In this case, the IODF must exist and the IODF definitions should match the infrastructure data.

- Update an existing HCM configuration with your data.

To do this, select **Open an existing file** in the **Choose HCM file for Import** dialog. If you import data into an existing configuration file, you are updating it with your infrastructure data. You can, for example,

- create cabinets, patchports, crossbar switches,
- provide new or changed serial numbers or descriptions,
- import cables and place them into connections,
- provide VOLSERS of devices,
- create and delete port-CHPID, port-port, and port-CU links.

You can either import all the data in a table, or you can import a subset of the table. For example, when it is not necessary for all columns or objects to be imported, you can import just the ones you need.

The fields and columns mentioned in the import stream must match current values, or an update is done. Blanks and 0 are valid values. Some table fields cannot be imported. They are ignored.

You cannot delete an object using the Import function.

#### Tip

To create the tables for import,

- you can convert your data to the HCM format with a program (for example, C or REXX), or
- use the export function first, then edit the tables, and import the changed tables into HCM.

The data format for importing, for example, how each row of data in the file corresponds to an object in the configuration is explained in the chapter “Data Format for Importing and Exporting” on page 283.

Choose **Import Data...** from the **File** menu. (This menu option is disabled, when an HCM configuration file is open.) A confirmation message is displayed which informs you that the import operation is a major update to your configuration and that it cannot be undone. Therefore, this message recommends that you save your configuration before importing data.

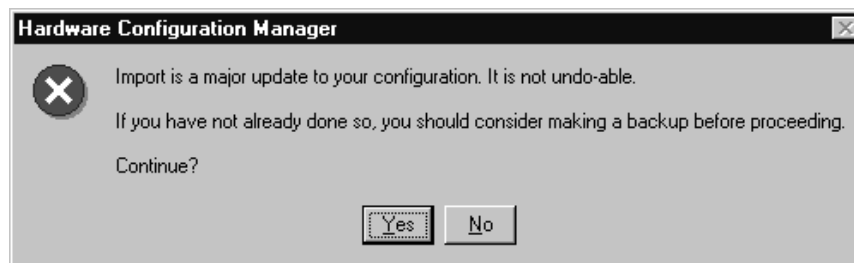


Figure 138. Hardware Configuration Manager Confirmation Message

**No** terminates the import and returns to the main menu. Choose **Yes** (the default) to continue. The **Choose HCM file for Import** dialog appears.

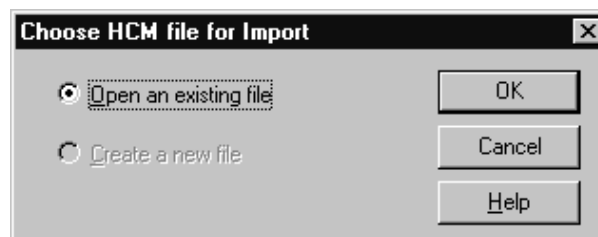


Figure 139. Choose HCM File for Import Dialog

You can choose to update an existing HCM file or to create a new one. When importing against an existing HCM file, the IODF may or may not be in sync with the HCM file. Therefore, it is possible to build, or add to, an HCM file by processing input from *both* the import file and an IODF concurrently.

**Note:** The option **Create a new file** is disabled when you are running in stand-alone mode.

Select **Open an existing file** (this is the default) and click on **OK**.

(You can also select **Create a new file**. Then, the **New** dialog appears instead. Specify a filename and click **OK**. The **High-level Qualifier** dialog appears where you can confirm or specify a high-level qualifier before the list of IODFs appears in the **Select IODF** dialog.)

The dialog **File Open** appears. Select an existing HCM file for update and click on **Open**.



Figure 140. File Open Dialog

On the following **Choose IODF** dialog, you can select if you want to work with the already associated IODF or if you want to work with an IODF that is not associated with the opened HCM file.

**General Concept on IODF Update Processing:** The fields which update the IODF receive special handling, that is, IODF objects which do not exist in the configuration yet, cannot be created and the following update types must be confirmed:

- Serial numbers in Processor, Switch, Control Unit, and I/O Device objects.
- Descriptions in Processor, Partition, CHPID, Switch, Control Unit, and I/O Device objects.
- VOLSERS in I/O Device objects.
- Labels in Port objects.
- Creation and deletion of Port-CHPID, Port-Port, and Port-CU links.

There will be one dialog for each of these fields. The dialogs only appear as needed.

**Note:** There could be several thousand items in each list. In such cases, the list box will not be able to contain all of the items. Should this occur, the user will be informed that the dialog will appear repeatedly to process the updates in "batches". Each batch will contain several thousand items.

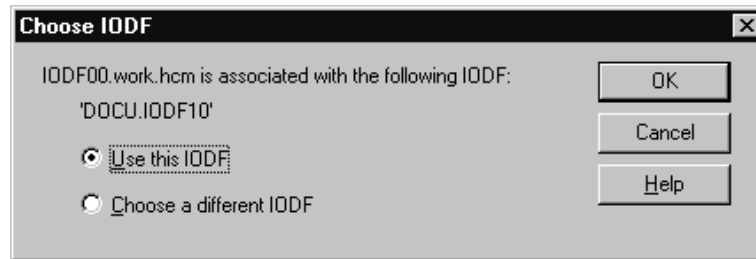


Figure 141. Choose IODF Dialog

Select the option **Use this IODF** and click on **OK**. Now the HCM file and the IODF are known. The **Choose Import Files** dialog appears.

(You can also select **Choose a different IODF**, when you want to use an IODF that is not yet associated to the HCM file. Then, the **High-level Qualifier** dialog appears where you can confirm or specify a high-level qualifier before the list of IODFs is displayed in the **Select an Alternate IODF** dialog.)

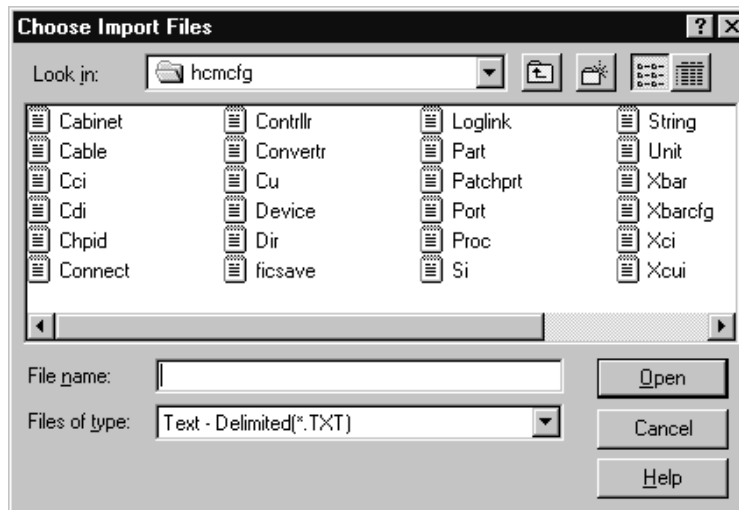


Figure 142. Choose Import Files Dialog

You can select one, multiple or all import files that appear in the list box in the specified directory that you want to use for your configuration.

The **Files of type** list contains a (default) entry suitable for comma-delimited import files with the file extension \*.csv, as well as text-delimited (\*.txt) files and the All files \*.\* entry.

Click on **Open** if you have selected at least one file for import. The **Text File Options** dialog appears.

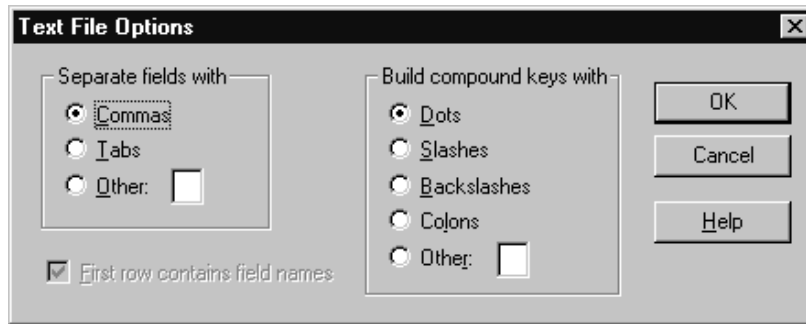


Figure 143. Text File Options Dialog

On this dialog you can specify how the import file should be interpreted by HCM. In the section **Separate fields with** you can specify the separator to be used between fields in each record. The **Other** field is one character long. When you type data into this field, the **Other** radio button is automatically selected. When you select one of the other radio buttons it clears the **Other** field.

In the section **Build compound keys with** you can specify the separator between parts of compound names such as a CHPID name (Processor name {separator} CHPID number).

Examples:

PROC1.30  
PROC1/30

In the **Other** field, HCM will not allow a parenthesis symbol "(" or ")" as a separator for compound names.

The **First row contains field names** check box is disabled. This checkbox is always selected and left disabled when importing data, because all import files must have column definition records.

The actual import processing occurs immediately after you have clicked on **OK** in the **Text File Options** dialog. The status bar shows progress information.

**Cancel** terminates the import operation and returns to the main menu.

However, HCM examines the import sources to determine if the IODF needs to be updated. If updates are required, for example, the **Proposed Description Updates** dialog appears where you can confirm the updates.

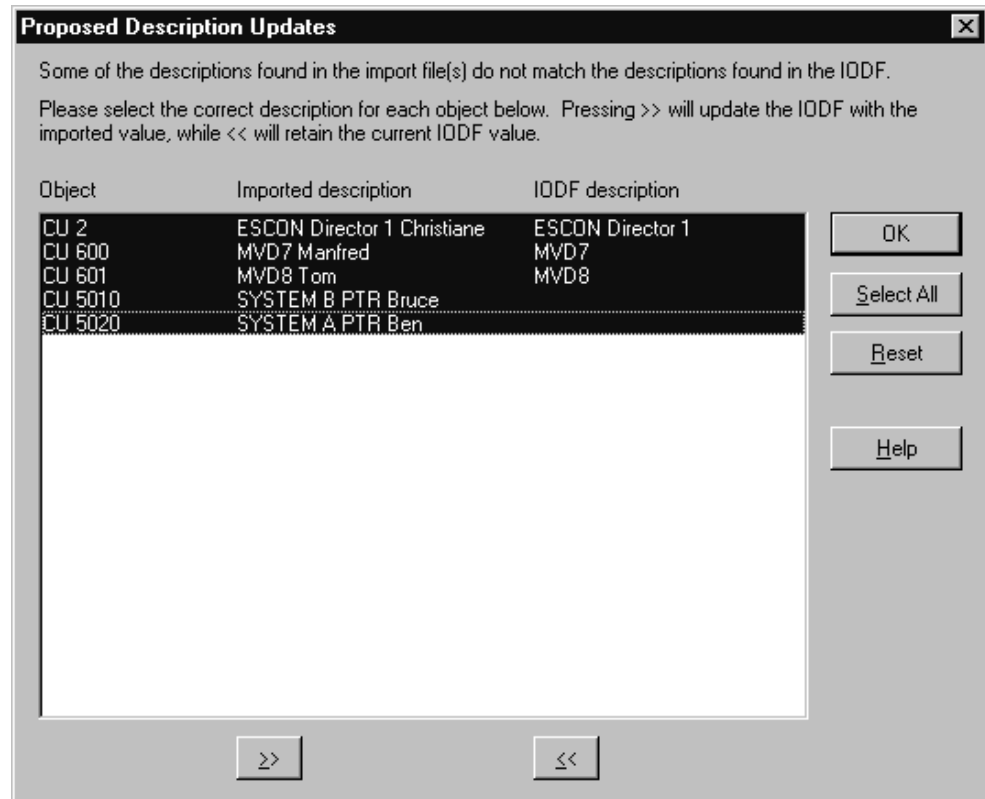


Figure 144. Proposed Description Updates Dialog

The list box shows one line for every object in the configuration for which the description value in the IODF and in the import files differ. On entry, all the lines are preselected. You can select one or more objects.

You can process lines in the list box through the use of the push buttons >> and <<. Once a line has been processed, HCM grays it. Processing a line means that the direction of the intended transfer is set as follows:

- pressing >> will update the IODF with the imported value
- pressing << will retain the current IODF value.

Each line of the list box shows the object identifier, the value of the description field in the import files read by HCM, and the value of the description field in the IODF on the host.

The dialog remains displayed even if all lines have been grayed, because the **Reset** button allows you to change the value of assignment for already processed lines. This button can be used to mark selected lines as requiring processing again, which removes their gray color and the >> or << symbol from those lines. This button unprocesses the selected processed lines.

Click on the **OK** button when you are satisfied with the transfer for each processed line. HCM will then proceed to update the local and/or the remote database. If, however, any unprocessed lines remain in the list box, clicking **OK** results in an error message stating that you must process all lines in the list box before clicking **OK**.

### Port <> CHPID/PORT/CU Links:

The normal behavior of HCM in the dialog when making or breaking a connection involving a switch port is to update the IODF with the appropriate IODF links. Making or breaking a connection via the import file will behave in a similar fashion, with the exception that you will have the opportunity to overwrite the IODF update.

**Note:** Physical connections are always made in the configuration file even if the IODF definitions are not updated.

A dialog will appear to display and confirm the Port link updates. For each port affected by the import, it will indicate the current state in the IODF and the proposed changes from the import file. For each affected port, all port links will be displayed so that you can see the information in context.

### Updating the Controller Serial Numbers:

The serial numbers assigned to control units come from the CONTRLLR records in the import file, not the control unit records. Control unit records have a serial number field, but this data is used for export-only. When a serial number is imported for a controller, HCM attempts to ensure that all control units in the controller have that serial number already. If there are any that do not, HCM suggests updates for those control units. If you accept the IODF values for the control unit serial numbers (rather than the imported values), the control units' serial numbers remain unchanged but the controller itself receives the new serial number.

**Note:** This can also occur as a result of a rejected host update which forces you to accept existing IODF values.

At the end of the import process, HCM steps through all controllers and ensures that there are no mismatches between the controller serial number and the serial numbers of control units contained in the controller. This is done in two steps:

1. If all the CUs in a controller have the same serial number, but the controller's serial number is different, the controller's serial number is changed to match the CUs.
2. If the CUs within a controller have serial numbers that differ from each other, CUs are moved out, one at a time, into other controllers. To avoid serial number conflicts, new controllers are created if necessary to hold the CUs moved out.

After moving out a CU, step 1 above is applied again, then step 2, repeating until there are no remaining conflicts. Thus, if you reject the suggested imported control unit serial numbers for any reason, it may result in the creation of additional controllers.

If your import is complete, an informational message is shown.

## Exporting Data

Choose **Export Data...** from the **File** menu. This menu option is only enabled, when a HCM configuration file is open. The **Export Data** dialog is opened.

### Tip

Export to an empty directory. A non-empty directory can already contain exported files from a previous export operation. If you do not choose to export exactly the same tables in the current export operation, some of the old files will continue to reside in the directory without being overwritten. Mixing files in the same directory from differing export operations can mislead you into attempting to use exported files which do not represent the same state of the configuration at all.

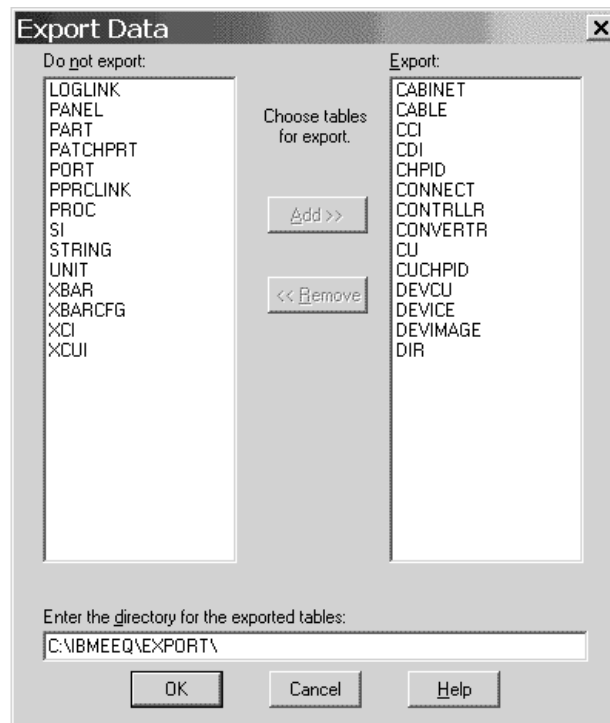


Figure 145. Export Data Dialog

Specify the tables to be exported, as well as the directory where the exported tables will be created. The specified directory must already exist.

The dialog is initialized based on values saved in the EEQHCM.INI file from the last execution of this dialog. The first time that you bring up this dialog, all tables will be enabled for export except for DEVCU, CUCHPID, and DEVIMAGE. The reasons for not exporting the three above mentioned tables by default are:

1. These tables deal with IODF data only.
2. They may be extremely large (especially the DEVCU and DEVIMAGE tables).

Select one or more tables in the **Do not export** section, click on **Add** (or double-click an entry) to move any selected tables from the left list box into the right list box to be included for export.

If you want to remove one or more tables from the **Export** section, select one or more tables, click on **Remove** (or double-click an entry) to move the tables to the **Do not export** section.

Click **OK** to accept the list box contents.

If any tables will be overwritten, you are asked if you want to replace the existing files. You can confirm with **OK** or reject with **Cancel**.

If no files will be overwritten, or you confirmed the query about replacing files with **OK**, the **Text File Options** dialog appears.

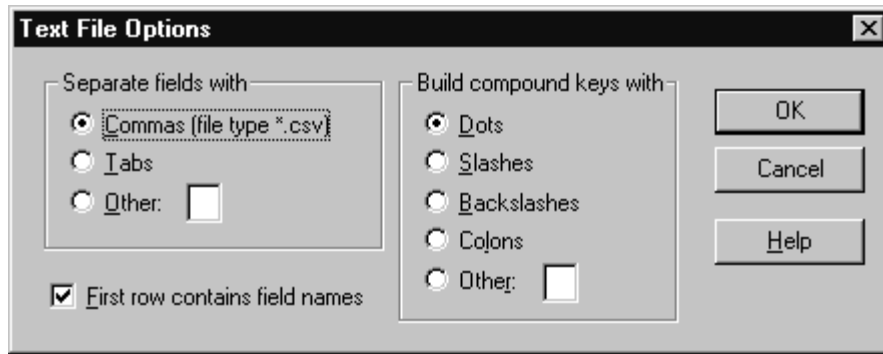


Figure 146. Text File Options Dialog

In this dialog you can specify how the export file should be constructed regarding the separators. The dialog is initialized with the values last used for import or export in the current HCM session. The defaults on first use in each session are commas, dots, and the **First row contains field names** is checked. In the section **Separate fields with** you can specify the separator between fields in each record. When you type data into the **Other** field, the adjacent radio button is automatically selected.

In the section **Build compound keys with** you can specify the separator between parts of compound names such as a CHPID name (Processor name {separator} CHPID number). For example, PROC1.30, PROC1/30. Because of the way tags are constructed for unlabeled strings, HCM will not allow a left or a right parenthesis as a separator for compound names.

The **First row contains field names** check box is enabled when you are exporting. If it is checked, HCM ensures that the first line in all export files is the column definition record.

Click on **OK** to perform the export. The status bar will contain progress information.

HCM informs you with an informational message that exporting completed successfully.

## Importing in Stand-alone Mode

Import is allowed in stand-alone mode, or with read-only access to the IODF. The tables can be imported to work configuration files.

An import operation that requires an update to the IODF is not possible. If an input record is encountered which would require an update to the IODF, for example, updating the description of a CHPID, an error message is issued. In other words, you can include CHPID records with descriptions, as long as those descriptions match the current description of the CHPID. The entire record is not

discarded, just the data columns which required update access to the IODF. In all cases, update access to the HCM file is required.

In particular, importing of VOLSERS is permitted in stand-alone mode, though this may cause appearance of the VOLSER Reconciliation dialog the next time the configuration is opened on-line. For more information see "VOLSER Reconciliation" on page 74.

## Exporting in Standalone Mode

Exporting is possible in stand-alone mode.

Some tables cannot be exported in stand-alone mode from a work configuration file, because they contain data which is only available from the IODF (DEVCU, CUCHPID, DEVIMAGE).

All tables can be exported from a production configuration file.

---

## Using Import as a Migration Aid

Many of the fields, and tables are optional when a new configuration file is being created from an import file and an IODF. This section provides guidelines of what is really necessary.

**PROC** Entries in this table need only be provided when updating or specifying attributes for these objects. Alternate processors, and processors which are in the "One Processor Per Partition" style need to appear in the import file. In the normal case, processors are created based on the IODF.

**PART** Entries in this table need only be provided when updating or specifying attributes for these objects. Partitions are created based on the IODF.

**CHPID** Entries in this table need only be provided when updating or specifying attributes for these objects. CHPIDs are created based on the IODF.

**DIR (Switches)** Entries in this table need only be provided when updating or specifying attributes for these objects. Switches are created based on the IODF.

**PORT (Switch Ports)** Ports which have a LASER interface instead of a LED need to appear in the import file. All others are created (as LED interface) based on the IODF.

**CONTRLLR** Controllers which need to be associated with a specific physical description (for example, 3990s) need to appear in the import file. Controllers which are grouped with other controllers (for example, Dual Frame, and tape controllers grouped with communicator cables) need to be mentioned in the import file. All controllers mentioned in the CONNECT table must appear in the import file.

**CCI (Controller Channel Interfaces)** For controllers which have more than the minimum number of channel interfaces allowed by their physical description file, all interfaces beyond the minimum need to appear in the import file. These records are also necessary to specify the interface type if the default interface type for the controller is not appropriate.

**CDI (Controller Device Interfaces)**

These can usually be omitted. For controllers which have more than the minimum number of device interfaces allowed by their physical description file, all interfaces beyond the minimum need to appear in the import file. Controllers with a variable number of device interfaces are very rare.

**CU (Control Units)**

CUs which are contained in a controller which has more than one segment should appear in the import file. This ensures that the load/resync process will place the CU into the proper segment. If a proper serial number has been assigned to a control unit in the IODF, it need not appear in the import file.

**STRING**

Strings which need to be associated with a specific physical description (for example, 3880s, RAMAC) need to appear in the import file. All strings mentioned in the CONNECT table must appear in the import file.

**SI (String Interface)**

This table can usually be omitted. The minimum number of string interfaces are created as necessary based on the physical description.

**UNIT** Entries in this table need only be provided when updating or specifying attributes for these objects. Units are created as necessary based on the physical description.

**DEVICE**

Where the string which contains this device has been included in the import file, the first DEVICE in the string should also appear in the import file.

**XBAR** All crossbar switches you wish to create need to appear in the import file.

**XCI (Crossbar Channel Interface)**

The import operation does not read this table.

**XCUI (Crossbar Control Unit Interface)**

The import operation does not read this table.

**XBARCFG**

Entries in this table need only be provided when updating or specifying attributes for these objects. This table can be omitted.

**CABINET**

All cabinets you wish to create need to appear in the import file.

**PANEL**

All panels you wish to create within a specific cabinet.

**PATCHPRT**

Entries in this table need only be provided when updating or specifying attributes for these objects. Patchports are created based on the information in the CABINET table.

**CONVERTR**

All converters mentioned in the CONNECT table must appear in the import file.

**CABLE**

All named cables mentioned in the CONNECT table must appear in the Import file.

## LOGLINK

Entries in this table need only be provided when updating or specifying attributes for these objects.

## CONNECT

Each connection you wish to create must appear in the import file. (The load/resync process may create additional connections as well.)

## PPRCLINK

All PPRC links/PPRC connections you wish to create, need to appear in the import file.

## Table Summary

Many of these tables are optional. See “Using Import as a Migration Aid” on page 297 for a discussion of the tables required to create a configuration using import. The DEVCU, CUCHPID, and DEVIMAGE tables are provided to facilitate reporting of logical connectivity based on exported files.

The table names have been limited to 8 characters to maintain a one to one correspondence between the table names and the filenames used by the export process, and by defining the database tool reading the exported data. For example, the PATCHPRT table is written to PATCHPRT.TXT.

*Table 6. Table Summary*

Category	Table name	Description
Processor related	PROC	a processor, see “PROC Table” on page 301
	PART	a partition, see “PART Table” on page 303
	CHPID	a CHPID, see “CHPID Table” on page 303
Switch related	DIR	a switch, see “DIR Table” on page 305
	PORT	a switch port, see “PORT Table” on page 305
Controller/Control unit related	CONTRLLR	a physical controller, see “CONTRLLR Table” on page 306
	CCI	a controller channel interface, the interfaces on the top of a controller: A, B, C ..., see “Controller Channel Interface (CCI) Table” on page 309
	CDI	a controller device interface, the interfaces on the bottom of the controller: SP0, SP1, ..., see “Controller Device Interface (CDI) Table” on page 310
	CU	an IODF control unit, see “CU Table” on page 311
String/Device related	STRING	a physical string, see “STRING Table” on page 312
	SI	a string interface, the interfaces on the top of a string: A0, A1 ..., see “String Interface (SI) Table” on page 314

Table 6. Table Summary (continued)

Category	Table name	Description
	<b>UNIT</b>	a physical unit of a string, see “UNIT Table” on page 314
	<b>DEVICE</b>	an IODF I/O device, see “DEVICE Table” on page 315
Crossbar switch related	<b>XBAR</b>	a physical crossbar switch, see “XBAR Table” on page 316
	<b>XBARCFG</b>	a named crossbar configuration describing the crossbar connectivity, see “XBARCFG Table” on page 317
	<b>XCI</b>	a crossbar channel interface (not read by the import function), see “Crossbar Channel Interface (XCI) Table” on page 317
	<b>XCUI</b>	a crossbar control unit interface (not read by the import function), see “Crossbar Control Unit Interface (XCUI) Table” on page 317
Patchport related	<b>CABINET</b>	a patchport cabinet, see “CABINET Table” on page 318
	<b>PANEL</b>	a patchport panel, see “PANEL Table” on page 318
	<b>PATCHPRT</b>	a patchport, see “PATCHPRT Table” on page 319
Connection related	<b>CABLE</b>	a physical cable, see “CABLE Table” on page 321
	<b>CONVERTR</b>	a converter, see “CONVERTR Table” on page 320
	<b>LOGLINK</b>	describes the end points of a logically complete series (see “LOGLINK Table” on page 322). Useful for reporting purposes. See “LOGLINK Table” on page 322.
	<b>CONNECT</b>	a connection between two objects, see “CONNECT Table” on page 325
	<b>PPRCLINK</b>	a PPRC link/PPRC connection, see “PPRCLINK Table” on page 328
Logical connection related	<b>DEVCU</b>	device - control unit connections, see “DEVCU Table (Export-Only)” on page 329
	<b>CUCHPID</b>	control unit - CHPID connections, see “CUCHPID Table (Export-Only)” on page 329
	<b>DEVIMAGE</b>	device - processor image connections (an image being a logical partition or the single image in a BASIC mode processor), see “DEVIMAGE Table (Export-Only)” on page 330

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## Detailed Table Formats

Fields which are always required are in **boldface type**. All other fields are optional, at least when updating an object. Optional fields which are required when creating an object are noted as such in the column description.

The tag **EO** means export-only and indicates that the field is filled in by export, and is read in by import but is not used to update the object. These fields contain IODF data.

Data columns which update the IODF are marked with **<Updates the IODF>**.

Objects which must be present in the IODF are marked with **<IODF Key>**.

Fields which are ignored in certain contexts, are still validated for correctness (for example, any data supplied in a numeric column must be numeric).

For a number of fields, a default value is indicated. When importing, it is important to realize that the default value is only used when a new object is being created and when no data is provided in the import file for that field.

## PROC Table

Table 7. *PROC Table*

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>PROC</b>
<b>ID</b>	Text	<IODF Key> The ID of the IODF object. (This is the processor's name.)
Grouped with	Text	Applicable only for new processors that are not already in the PWS configuration.  For alternate processors, and OP PP (One Processor Per Partition) style processors, the name of the primary processor that this processor should be grouped with.  Ignored for processors which are already in the PWS configuration file (they have already been placed).
Style	Enum	Applicable only for new processors that are not already in the PWS configuration.  If <i>Grouped with</i> is specified: <ul style="list-style-type: none"><li>• This field defaults to the style of the <i>Grouped with</i> processor.</li></ul> If specified here, it must match the style of the <i>Grouped with</i> processor.  If <i>Grouped with</i> is blank, or contains your processor name (grouped with self): <ul style="list-style-type: none"><li>• This field defaults to IBM.</li><li>• Either value may be coded.</li></ul> Valid values are IBM or OP PP (One Processor Per Partition). Ignored for processors which are already in the PWS configuration file.

Table 7. PROC Table (continued)

Field Name	Format	Description
Status	Enum	<p>Applicable only for new processors that are not already in the PWS configuration.</p> <p>If <i>Grouped with</i> is specified and that processor is IBM style:</p> <ul style="list-style-type: none"> <li>• Alternate is the only valid value.</li> <li>• This field defaults to alternate in this case.</li> </ul> <p>If <i>Grouped with</i> is specified and that processor is OP PP style:</p> <ul style="list-style-type: none"> <li>• Either value is valid.</li> <li>• This field defaults to alternate in this case.</li> </ul> <p>If <i>Grouped with</i> is blank, or contains your processor name (grouped with self):</p> <ul style="list-style-type: none"> <li>• Primary is the only valid value.</li> <li>• This field defaults to primary in this case.</li> </ul> <p>Valid values are: primary, alternate.</p> <p>Ignored for processors which are already in the PWS configuration file.</p>
Short name	Text	<p>The short name of the physical machine which contains this processor.</p> <p>Defaults to the first two characters of the processor ID (or first character in the case of single character IDs).</p> <p>Export will place the same value in this column for all processors in the physical machine.</p> <p>On import, all processors in the machine are expected to have the same value for this attribute, but this is not strictly enforced. If the specified value does not match that of other PROC records in the import file having the same machine, the last PROC record found in the import file will be taken. You will <i>not</i> be informed with a warning message.</p> <p>Valid values: any string of one, or two text file characters in which each character must be either non-alphabetic or uppercase alphabetic. An empty string is not a valid value.</p>
Serial number	Text	<Updates the IODF> The serial number of the IODF object.
Description	Text	<Updates the IODF> The description of the IODF object.
Model	Text EO	Value taken from the IODF object. For example, 9021-720.
Support level	Text EO	Value taken from the IODF object.
Mode	Text EO	Value taken from the IODF object. For example, BASIC.
Network name	Text EO	Value taken from the IODF object.
CPC name	Text EO	Value taken from the IODF object.
User field 1	Text	User field 1
User field 2	Text	User field 2

Table 7. PROC Table (continued)

Field Name	Format	Description
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## PART Table

Table 8. PART Table

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>PART</b>
<b>ID</b>	Text	<IODF Key> The ID of the IODF object. This consists of the processor name followed by a slash "/" and the partition name.
Description	Text	<Updates the IODF> The description of the IODF object.
Number	Text EO	Value taken from the IODF object. The partition number in hex. Blank if not applicable.
Usage	Text EO	Value taken from the IODF object. For example, CF.
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## CHPID Table

Table 9. CHPID Table

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>CHPID</b>
<b>ID</b>	Text	<IODF Key> The ID of the IODF object. This consists of the processor name followed by a slash "/" and the hex CHPID number.
Unique Key	Text EO	The unique key for this object. Composed of "Table Name:ID"
Description	Text	<Updates the IODF> The description of the IODF object.
Type	Text EO	Value taken from the IODF object.
Mode	Text EO	Value taken from the IODF object. For example, SHR.
Dynamic switch	Text EO	Value taken from the IODF object. Blank if not applicable. For example, 0F.

Table 9. CHPID Table (continued)

Field Name	Format	Description
Physical number	Hex	<p>The physical channel onto which this CHPID is mapped. Defaults to the CHPID number.</p> <p>This is only applicable for OPPP style processors, and need only be specified if the logical CHPID is mapped onto a different physical channel.</p> <p>In cases where the CHPID has no corresponding physical object, 0 will appear here on export. It is not possible to import CHPIDs without a corresponding physical object. Valid values are: 0, 1, 2, ..., 1FF</p>
Interface Type	Enum	<p>One of HCM's allowed CHPID interface types.</p> <p>Defaults based on the CHPID type of the CHPID in the IODF.</p> <p>This need only be specified if the physical interface type is not compatible with the logical CHPID type.</p> <p>Valid values are: serial, parallel, coupling, IOC, OSA.</p>

### Sparse CHPID Mapping for OPPP Processors

When processors are defined using the One Processor Per Partition (OPPP) style, several logical processors can share the same physical hardware, including the limited set of channel paths physically present on the machine. A one-to-one association of logical CHPIDs to physical channel paths is set up on a per processor basis. Usually, CHPID *nn* maps to path *nn*, regardless of which processor CHPID *nn* belongs to. However, it is possible to make non-default associations such that, for instance, CHPIDs 00 through 1F for PROC1 map to paths 00 to 1F, while CHPIDs 00 through 1F for PROC2 map to paths 100 to 11F.

Any non-default CHPID-to-path mapping can be represented in the CHPID record by filling in the "Physical number" field. It is only possible to represent CHPID-to-path mapping for CHPIDs which actually exist in the configuration, because CHPID import records are rejected by HCM unless the CHPID exists. When editing an existing configuration using the HCM interface you can specify mappings for CHPIDs which have yet to be created. This cannot be done using the Import function.

**Example:** If you were to map CHPID 00 to path 10, CHPID 00 must exist in the configuration. If CHPID 10 existed, you could also specify a path for it to map to. Assuming, however, that CHPID 10 does not exist, no mapping can be specified for it in an import file, and HCM will automatically assign a mapping to it that does not conflict with any other mappings. If the next free path number (after 10) that is free is 100, then CHPID 10 will be mapped to path 100. (100 is a likely choice, because HCM looks for an unmapped path starting with the path that CHPID 10 used to be mapped to, in this case 10. All the paths up to FF are spoken for due to the default mapping.)

```
CHPID 00 ====> Path 10   assigned by CHPID record in import file
CHPID 10 ====> Path 100  assigned by default (first free path)
```

This is known as sparse CHPID mapping, because the import file does not contain a record to map every CHPID slot to a path slot. Some CHPID slots are allowed to default. Export practices sparse CHPID mapping on output.

## OPPP and Shadow Processor CHPID/Path Mapping Issues

If a configuration contains shadow processors or One Processor Per Partition style processors, it is possible for more than one CHPID to use the same physical channel path. LOGLINK and CONNECT records mention CHPIDs when identifying a physical channel path. A problem arises if a set of import/export files describes more than one connection to a path. Therefore, during export, LOGLINK and CONNECT records are only generated once for each path, not for each CHPID using the path.

If you are generating files for import using tools other than HCM's export use the same approach. That is, you should not generate duplicate LOGLINK and CONNECT records when the configuration contains paths which map to multiple CHPIDs.

## DIR Table

Table 10. DIR Table

Field Name	Format	Description
Table Name	Text	DIR
ID	Hex	<IODF Key> The ID of the IODF object.
Serial number	Text	<Updates the IODF> The serial number of the IODF object.
Description	Text	<Updates the IODF> The description of the IODF object.
Model	Text EO	Value taken from the IODF object. For example, 9032-3.
Controller Label	Text	Applicable only for new switches that are not already in the PWS configuration.  The label which should be applied to the internal controller of this switch.  Ignored for switches which are already in the PWS configuration file.
String Label	Text	Applicable only for new switches that are not already in the PWS configuration.  The label which should be applied to the internal string of this switch.  Ignored for switches which are already in the PWS configuration file.
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## PORT Table

Table 11. PORT Table

Field Name	Format	Description
Table Name	Text	PORT

Table 11. *PORT Table (continued)*

Field Name	Format	Description
ID	Text	<IODF Key> The hex switch number followed by a slash "/" and the hex port number.
Unique Key	Text EO	The unique key for this object. Composed of "Table Name:ID"
Interface type	Enum	One of HCM's allowed Port interface types. Valid values are: LED, Laser.
Name	Text	<Updates the IODF> The descriptive name of the IODF port.

**Note:** Ports which are not "installed" in the IODF are not exported, and cannot be imported.

## CONTRLLR Table

Table 12. *CONTRLLR Table*

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>CONTRLLR</b>
Label	Text	Unique label of an HCM physical controller. For example, 3990 #12.
Serial number	Text	<Updates the IODF> In addition to updating the controller object (a PWS object), this field will be used to update the IODF for all control units that the controller contains.
IODF control unit type	Text	<p>The type-model of the controller. For example, 3990-6.</p> <p>Applicable only for new controllers that are not already in the PWS configuration. Ignored for controllers which are already in the PWS configuration file.</p> <p>Export places the following in this field:</p> <p>The type-model of one of the control units in the controller. The assumption is that all control units in the controller are of the same type. Where the controller contains more than one control unit, the specific control unit chosen is undefined. If the controller contains no control units, this field will be blank.</p> <p>See the "Usage Note" on page 307 in the PDF Name column.</p>
PDF AbbrevId	Text	<p>The abbreviated ID (AbbrevId = ) of one of HCM's physical description templates. For example, RAMAC2.</p> <p>Applicable only for new controllers that are not already in the PWS configuration. Ignored for controllers which are already in the PWS configuration file.</p> <p>Export places the following in this field:</p> <p>If a specific PDF was used, and that PDF has an abbreviated ID, it will appear here. Otherwise this field will be blank.</p> <p>See the "Usage Note" on page 307 in the PDF Name column.</p>

Table 12. CONTRLLR Table (continued)

Field Name	Format	Description
PDF Name	Text	<p>The label (Subsystem =) of one of HCM's physical description templates. For example, IBM 3990 Model 6 DASD Controller.</p> <p>Applicable only for new controllers that are not already in the PWS configuration. Ignored for controllers which are already in the PWS configuration file.</p> <p>Export places the following in this field:</p> <p>If a specific PDF (physical description file) was used, the physical description name (Subsystem =) will appear here. Otherwise this field will be blank.</p> <p><b>Usage Note:</b> Import usage of the IODF Control Unit Type, PDF AbbrevId, and PDF Name fields:</p> <p>These fields are used to determine which HCM physical description should be associated with a new controller. Only one of these fields is used on input. They are evaluated in the following order:</p> <ol style="list-style-type: none"> <li>1. PDF name is used if the column is present and contains data. If specified it must be valid.</li> <li>2. PDF AbbrevId is used if the column is present and contains data. If specified it must be valid.</li> <li>3. HCM's normal search for a PDF based on the IODF Control Unit Type field. If the IODF Device Type is blank or invalid, the default PDF is assigned.</li> </ol>
Display class	Enum	<p>One of HCM's controller display classes.</p> <p>If the controller is being created, and this field is not specified, it will default as follows:</p> <ol style="list-style-type: none"> <li>1. if the PDF specifies a display class, that class will be used.</li> <li>2. the display class will default based on the first control unit that is placed into this controller.</li> <li>3. if neither of the above apply, the display class will default to "Other".</li> </ol> <p>Valid values are: DASD, Tape, Terminal, Unit record, Telecommunications, MICR/OCR, Graphics, CTC, Other.</p>
Installed	Bool	<p>Yes (this is the default) indicates that the controller should be marked as installed.</p>
Integrated	Bool	<p>Yes indicates that the controller should be marked as containing integrated devices (a 3745, for example). The default is based on the display class:</p> <p>DASD and Tape: No All others: Yes</p>

Table 12. CONTRLLR Table (continued)

Field Name	Format	Description
Grouped with	Text	Applicable only for new controllers that are not already in the PWS configuration.  For controllers which can be grouped together with communicator cables (3803 and 3480 for example), and Dual Frame controllers, this column specifies the Controller Label of the leftmost controller in the subsystem. This field is valid only for controller with PDFs which allow more than one controller in a subsystem.  Ignored for controllers which are already in the PWS configuration file (they have already been placed).
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## Interfaces on Controllers

When controllers are created with the import facility, each controller is created with the minimum number of channel and device interfaces. This is different from normal HCM behavior. Normally HCM would create the controller with the default number of interfaces as specified in the PDF. The minimum number of channel interfaces is the lowest value specified in the Allow clause of the PDF, or 1 for the default PDF. Additional interfaces are created by mentioning them in the CCI table.

Note that it is possible with HCM to decrease the number of interfaces below the minimum number of interfaces specified in the PDF Allow clause. For example, it is possible to decrease the number of interfaces on a 3990 segment so that each segment contains only one interface. It is not possible to create this configuration with import without altering the PDF to allow a minimum of 1 interface on a 3990. This is a known instance where an export, followed by an import into an empty file, will not recreate the original configuration exactly.

## Controller Channel Interface (CCI) Table

Table 13. CCI Table

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>CCI</b>
<b>Interface name</b>	Text	<p>The name of the controller channel interface, in the following form:</p> <p>controller label[/segment name][/adapter name] /interface label</p> <p><b>controller label</b> label of controller</p> <p><b>segment name</b> segment label (used only with controllers having more than one segment)</p> <p><b>adapter name</b> channel adapter label (used only with controllers using channel adapter scheme)</p> <p><b>interface label</b> channel interface label (A, B, ...)</p> <p>In cases where the components (segment, channel adapter, or interface) are not given explicit names in the PDF, a zero-based index is used instead. (for example, channel adapter 2 is the third channel adapter in the segment or controller which contains it).</p> <p>Examples: 3480 #9/A 3990 #12/SC0/A 6100 #5/Bus 0/A/0</p>
<b>Unique Key</b>	Text EO	The unique key for this object. Composed of "Table Name:Interface name".
<b>Interface type</b>	Enum	<p>One of HCM's allowed interface types.</p> <p>The default is based on the display class of the controller: DASD and tape: serial All others: parallel</p> <p><b>Note:</b> If the interface type of an existing interface is being changed, this interface will be disconnected if necessary before being updated. This is necessary since the interface type change will mean that the cable currently connected to this interface will no longer be of the correct type.</p> <p>Valid values are: serial, parallel, IOC, OSA.</p>

**Note:** All controller channel interfaces beyond the minimum must be explicitly created with this record. If a CCI must be created, all intervening CCIs and channel adapters will be created as necessary. For example, creating the fourth CCI will automatically create the second and third if they do not already exist. In this example, the interface types of the second and third interfaces would be assigned so that they match the type of the fourth interface.

## Controller Device Interface (CDI) Table

Table 14. CDI Table

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>CDI</b>
<b>Interface name</b>	Text	<p>The name of the controller device interface, in the following form:</p> <p>controller label[/segment name][[/adapter name] /interface label  <b>controller label</b>  label of controller  <b>segment name</b>  segment label (used only with controllers  having more than one segment)  <b>adapter name</b>  device adapter label (used only with controllers  using device adapter scheme)  <b>interface label</b>  device interface label. When there is only one  device interface on the adapter or segment, the  interface label may be omitted.</p> <p>In cases where the components (segment, device  adapter, or interface) are not given explicit names in the  PDF, a zero-based index is used instead. For example,  device adapter 2 is the third device adapter in the  segment or controller which contains it.</p> <p>Examples:  6100 #5/Bus 0/3 (interface label omitted)  5500 #3/Y-Bus/6/1 (second unnamed interface on adapter 6)</p> <p>Export always omits the interface name when there is  only one device interface on the adapter or segment.</p>
<b>Unique Key</b>	Text EO	The unique key for this object. Composed of "Table Name:Interface Name".

**Note:** For those controller types which support a variable number of device interfaces, all controller device interfaces beyond the minimum number (which are created automatically) must be explicitly created with this record. If a CDI must be created, all intervening CDIs and device adapters will be created as necessary.

## CU Table

Table 15. CU Table

Field Name	Format	Description
Table Name	Text	CU
ID	Hex	<IODF Key> The ID of the IODF object.
Container	Text	<p>Applicable only for new control units that are not already in the PWS configuration.</p> <p>Specifies the exact placement of the "new" control unit within a physical controller. A container object is either a controller label (for single segment controllers such as 3174), or a controller label/segment name, for controllers which have two segments. If not specified, HCM will place the device using the normal heuristics employed during the IODF load/resync process (this placement is based primarily on serial number). For example, 3174 #5, 3990 #12/SC0.</p> <p>Internal switch control units (those which are logically connected to port FE), and control units of type CTC or CFS, receive special treatment as follows:</p> <ul style="list-style-type: none"> <li>• Import ignores this field and the objects are placed automatically.</li> <li>• For CTC and CFS control units, export leaves this field blank since there is no meaningful container object for these control units.</li> </ul> <p>Ignored for control units which are already in the PWS configuration file (they have already been placed).</p>
Serial number	Text EO	<p>The serial number of the IODF object.</p> <p><b>Note:</b> HCM uses the serial number of the container controller to update the IODF with control unit serial numbers.</p>
Description	Text	<Updates the IODF> The description of the IODF object.
Type	Text EO	Value taken from the IODF object.

## STRING Table

Table 16. *STRING Table*

Field Name	Format	Description
Table Name	Text	<b>STRING</b>
Tag	Text	<p>A unique tag to identify the string. This tag has no meaning outside the context of this import file.</p> <p>For new strings, any meaningful tag may be used. We recommend using the first device number in the string.</p> <p>For existing strings, HCM will first attempt to locate the one string which has this value as an explicit label. If no string was found, HCM will interpret the tag as a device ID and look for the string, labeled or not, that contains the device.</p> <p><b>Usage Note:</b> unlabeled strings. If the string contains devices, the tag will be the device ID of the first (the lowest device number) of the string. If an unlabeled string has no devices, its tag will be of the form "String #<i>n</i>" where <i>n</i> is an integer value which is simply incremented each time such a tag is generated in order to guarantee uniqueness.</p> <p>Examples:  TS0 P00L 1  400  400(MVS1)</p>
IODF device type	Text	<p>The type-model of the string. For example, 3390.</p> <p>Applicable only for new strings that are not already in the PWS configuration. Ignored for strings which are already in the PWS configuration file.</p> <p>Export places the following in this field:</p> <p>The type-model of one of the device in the string with the lowest device number. If the string contains no devices, this field will be blank.</p> <p>See the "Usage Note" on page 313 in the PDF Name column.</p>
PDF AbbrevId	Text	<p>The abbreviated ID (AbbrevId = ) of one of HCM's physical description templates. For example, RAMAC2.</p> <p>Applicable only for new strings that are not already in the PWS configuration. Ignored for strings which are already in the PWS configuration file.</p> <p>Export places the following in this field:</p> <p>If a specific PDF was used, and that PDF has an abbreviated ID, it will appear here. Otherwise this field will be blank.</p> <p>See the "Usage Note" on page 313 in the PDF Name column.</p>

Table 16. STRING Table (continued)

Field Name	Format	Description
PDF Name	Text	<p>The label (String =) of one of HCM's physical description templates. For example, IBM RAMAC 2 Array DASD.</p> <p>Applicable only for new strings that are not already in the PWS configuration. Ignored for strings which are already in the PWS configuration file.</p> <p>Export places the following in this field:</p> <p>If a specific PDF was used, the physical description name (String =) will appear here. Otherwise this field will be blank.</p> <p><b>Usage Note:</b> Import usage of the "IODF Device Type", "PDF AbbrevId", and "PDF Name" fields:</p> <p>These fields are used to determine which HCM Physical Description should be associated with a new string. Only one of these fields is used on input. They are evaluated in the following order:</p> <ol style="list-style-type: none"> <li>1. PDF Name is used if the column is present and contains data. If specified it must be valid.</li> <li>2. PDF AbbrevId is used if the column is present and contains data. If specified it must be valid.</li> <li>3. HCM's normal search for a PDF based on the IODF Device Type field. If the IODF Device Type is blank or invalid, the default PDF is assigned.</li> </ol>
Label	Text	<p>A label for the string. Strings in HCM need not be explicitly assigned a label. When the label is absent, HCM will display a label of the form "String xxxx-yyyy" where xxxx is the device number of the first device in the string and yyyy is the device number of the last device number in the string. For example, string 300-31F.</p>
Installed	Bool	<p>Yes (this is the default) indicates that the string should be marked as installed.</p>
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## String Interface (SI) Table

Table 17. SI Table

Field Name	Format	Description
Table Name	Text	SI
Interface name	Text	The string tag followed by a slash "/" and the interface name. The interface name must be an allowable value in terms of the string PDF. For example, TSO POOL 1/A0, 400/A0, or 400(MVS1)/A0.
Unique Key	Text EO	The unique key for this object. Composed of "Table Name:Interface Name".

**Note:** All string interfaces beyond the minimum must be explicitly created with this record. If an SI must be created, all intervening SIs will be created as necessary.

## UNIT Table

Table 18. UNIT Table

Field Name	Format	Description
Table Name	Text	UNIT
Tag	Text	Identifier consisting of string tag followed by a slash "/" and a zero-based unit index. Units are numbered 0 to <i>n</i> -1 in row-major order. In strings which have the twoheaded attribute in the PDF, such as 4-path 3380, the units are counted from top to bottom in the left column, and then top to bottom in the right column. If the unit does not yet exist in the string, intervening units are created as necessary when creating the new unit.  It is not possible to create additional units in the internal string of a switch.
Serial number	Text	The physical serial number of the unit.
Label	Text	The label of the unit.
Installed	Bool	Yes (this is the default) indicates that the string should be marked as installed.
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## DEVICE Table

Table 19. DEVICE Table

Field Name	Format	Description
Table Name	Text	DEVICE
ID	Text	<p>&lt;IODF Key&gt; The ID of the IODF object. Normally the device number. To help ensure uniqueness, the device number is followed by the name, enclosed in parentheses, of one of the operating system configurations to which the device is defined. If the device is not defined to any operating system, nothing is added to the device number. On input, any of the defined operating systems will serve to uniquely identify the device. On output, export will choose the first defined operating system as sorted alphabetically in EBCDIC. Examples:</p> <p>400 400(MVS1)</p>
Container	Text	<p>Applicable only for new devices that are not already in the PWS configuration.</p> <p>Specifies the exact placement of the device into a physical container. Container is a string tag or a unit tag. If a unit tag is specified, the device will be placed into that unit. If a string tag is specified, the device will be placed into the first available position in that string using HCM's normal heuristics. If this field is not specified, HCM will place the device using the normal heuristics employed during the IODF load/resync process. For example, 400, 400/0.</p> <p>On output, export always places a unit tag in this field.</p> <p>Internal switch devices (those which are logically connected via a control unit to port FE), and devices of type SCTC, BCTC, FCTC, CFS or CFP, receive special treatment as follows:</p> <ul style="list-style-type: none"> <li>• Import ignores this field and the objects are placed automatically.</li> <li>• For SCTC, BCTC, FCTC, CFS and CFP devices, export leaves this field blank since there is no meaningful container object for these devices.</li> </ul> <p>Ignored for devices which are already in the PWS configuration file (they have already been placed).</p>
Serial number	Text	<Updates the IODF> The serial number of the IODF object.
Description	Text	<Updates the IODF> The description of the IODF object.
VOLSER	Text	<Updates the IODF> The VOLSER of the IODF object.
Type	Text EO	Value taken from the IODF object.

## XBAR Table

Table 20. XBAR Table

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>XBAR</b>
<b>Label</b>	Text	The physical label of the crossbar switch.
# of Channel Interfaces	Num	The number of interfaces across the top of the crossbar switch.
		For existing crossbars, decreasing the number of channel interfaces will cause connected channel interfaces to be disconnected before being deleted.
		This is an optional field. If a crossbar is being created, and this field is absent, the default number of channel interfaces ( 1 ) will be created.
# of Control Unit Interfaces	Num	The number of interfaces across the side of the crossbar switch.
		For existing crossbars, decreasing the number of control unit interfaces will cause connected control unit interfaces to be disconnected before being deleted.
		This is an optional field. If a crossbar is being created, and this field is absent, the default number of control unit interfaces (1) will be created.
Serial number	Text	The serial number of the crossbar switch.
Short name	Text	The short name of the crossbar switch.
Default XBARCFG	Text	Default crossbar switch configuration.
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## XBARCFG Table

Table 21. XBARCFG Table

Field Name	Format	Description
Table Name	Text	XBARCFG
Name	Text	The name of the crossbar configuration. This consists of the XBAR label followed by a slash "/" and the configuration name. The name of the default configuration "normal" is also accepted.
Row 1 Channel Interface	Text	The label of the channel interface to which this row (control unit interface) is connected. If this field is absent or blank, the row will be assigned no connectivity in this crossbar configuration. For example, 4.
Row 2 Channel Interface	Text	The label of the channel interface to which this row is connected. For example, 4.
...		
Row 32 Channel Interface	Text	The label of the channel interface to which this row is connected. For example, 4.

## Crossbar Channel Interface (XCI) Table

Table 22. XCI Table

Field Name	Format	Description
Table Name	Text	XCI
Interface name	Text	The XBAR label followed by a slash "/" and the interface name. The interface name is an integer from 1 to $n$ where $n$ is the number of channel interfaces.
Unique Key	Text EO	The unique key for this object. Composed of "Table Name:Interface Name"

**Note:** This record is exported, but ignored on import.

## Crossbar Control Unit Interface (XCUI) Table

Table 23. XCUI table

Field Name	Format	Description
Table Name	Text	XCUI
Interface name	Text	The XBAR label followed by a slash "/" and the interface label. The interfaces are labeled A1, B2, C3, ..., Z26, AA27, AB28, ...
Unique Key	Text EO	The unique key for this object. Composed of "Table Name:Interface Name"

**Note:** This record is exported, but ignored on import.

## CABINET Table

Table 24. CABINET Table

Field Name	Format	Description
Table Name	Text	CABINET
Id	Text	This, rather than the cabinet description, serves as the object identifier, since HCM enforces that it is unique.
Description	Text	The description of the cabinet.
Model	Text	The descriptive text describing the cabinet model. Any character string. Typically one of HCM's predefined cabinet models. For example, IBM Main Distribution Frame.
Serial number	Text	The serial number of the cabinet.
Graphical Position	Enum	One of HCM's values for "Suggested Graphical Position".  Valid values are: no suggestion (this is the default), near processors, central, near devices.
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

**Note:** The fields 'Naming format', '# of Panel Spaces', '# of Groups per Panel', '# of Ports per Group', 'Sequenced Row First' are no longer exported in the CABINET table, but they are accepted as input. If any of these fields are supplied, the import files will be treated as "old style".

## PANEL Table

Table 25. PANEL Table

Field Name	Format	Description
Table Name	Text	PANEL
ID	Text	This consists of the cabinet short name followed by a slash "/" and a two-character panel ID.  If a panel of this ID does not exist in the cabinet, it will be added to the bottom of the cabinet.
Description	Text	The description of the panel.
Naming format	Text	The format string used to generate patchport labels for this panel.  This must be specified and must be a valid format string if the panel is being created.
# of rows	Num	The number of rows of patchports in the panel. Used only if the panel is being created; ignored if the panel already exists.  This field must be specified.

Table 25. PANEL Table (continued)

Field Name	Format	Description
# of columns	Num	The number of columns of patchports in the panel. Used only if the panel is being created; ignored if the panel already exists.  This field must be specified.
Sequenced row first	Bool	If Yes, patchports are sequenced in a row-first manner when displayed in lists or used in operations involving multiple patchports.

## PATCHPRT Table

Table 26. PATCHPRT Table

Field Name	Format	Description
Table Name	Text	PATCHPRT
Name	Text	The name of the patchport as generated by the patchport naming format for this cabinet. Resolution of patchport names is made after all cabinet objects have been updated with the naming format values in the import file.
Unique Key	Text EO	The unique key for this object. Composed of "Table Name:Patchport Name".
Cabinet	Text EO	The short name of the cabinet which contains this patchport.
Explicit Label	Text	A name specified by you that is explicitly assigned to the patchport (overriding the name which would be assigned with the patchport naming format).
Installed	Bool	Yes, if the group containing this patchport should be marked as installed. There is no default for this field, when no data is present here, the installed status is left unchanged. When panel spaces are created, all groups are marked as installed.

Since patchports are installed in groups, export will place the same value in this column for all patchports in the group.

On import, all patchports in the group are expected to have the same value for this attribute, but this is not strictly enforced. If the specified value does not match that of other PATCHPRT records in the import file having the same group, the last PATCHPRT record found in the import file will win. You will *not* be informed with a warning message.

## CONVERTR Table

Table 27. CONVERTR Table

Field Name	Format	Description
Table Name	Text	<b>CONVERTR</b>
Label	Text	<p>The label of the converter. If this label is not unique in the configuration, the row cannot be processed.</p> <p><b>Note:</b> Export will assign names to generic converters (converters which have no label). Importing this file will result in these labels being assigned to the converters. Export will assign names in the following format:</p> <ul style="list-style-type: none"> <li>• S-&gt;P #<i>nnn</i></li> <li>• P-&gt;S #<i>nnn</i></li> </ul> <p>This is an instance where an export operation followed by an import operation will not recreate the original configuration exactly.</p>
Unique Key	Text EO	The unique key for this object. Composed of "Table Name:Converter Label".
Type	Enum	<p>One of HCM's allowed converter types, as they appear in the Type: combo box of the Create Converter dialog.</p> <p>Valid values are: parallel-&gt;serial, serial-&gt;parallel.</p>
Position	Enum	<p>One of HCM's allowed values for position.</p> <p>Valid values are: top, bottom.</p> <p>This value is not used for unused converters (for example, for ones which are not connected). Export places the value "top" in this field for unused converters.</p>
Serial number	Text	The serial number of the converter.
User field 1	Text	User field 1
User field 2	Text	User field 2
User field 3	Text	User field 3
User field 4	Text	User field 4
User field 5	Text	User field 5

## CABLE Table

Table 28. CABLE Table

Field Name	Format	Description
Table Name	Text	CABLE
ID	Text	The cable identifier.
Type	Enum	<p>The three-character abbreviation for one of HCM's allowed cable types:</p> <p><b>GFP</b> Gray Fully Populated</p> <p><b>GPP</b> Gray Partially Populated</p> <p><b>BFP</b> Blue Fully Populated</p> <p><b>BPP</b> Blue Partially Populated</p> <p><b>BDI</b> Bi-directional</p> <p><b>SMJ</b> Single Mode Jumper (fiber)</p> <p><b>MMJ</b> Multi Mode Jumper (fiber)</p> <p><b>SMT</b> Single Mode Trunk (fiber)</p> <p><b>MMT</b> Multi Mode Trunk (fiber)</p> <p>This field is required when creating a new cable.</p> <p><b>Note:</b> If the type of an existing cable is changed to be incompatible with the interfaces it connects with, the cable will be removed from the connection and placed into the pool of "Unused cables". The interfaces will remain connected with a generic cable.</p>
Length	Text	A free form character string describing the length. For example, 50m.
Loss A	Float	<p>The value for dB Loss A of this fiber cable, in dB.</p> <p>For cables which are not composed of fiber optic:</p> <ul style="list-style-type: none"> <li>• Import ignores the value.</li> <li>• Export places 0 in this field.</li> </ul> <p>On import, the value 0 is treated as "N/A" (not available) by HCM. This is the default for new cables.</p>
Loss B	Float	The value for dB Loss B of this fiber cable, in dB. Same considerations as Loss A.
Comment	Text	User defined comments and text.

## LOGLINK Table

Table 29. LOGLINK Table

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>LOGLINK</b>
<b>Source</b>	Text	The name of the object which begins this logically complete series. For example, PROC1/30.
Source Type	Enum	Object type qualifier (table name) for the source. This is only necessary if the source does not uniquely identify a connectable object (for example, it is legal to have a processor named A1 and a switch also named A1, so A1/D2 could be a CHPID or a PORT; in such a case source type must be supplied to distinguish which of the two objects is being connected). If it is supplied, source must identify an object of the given type.  If omitted, the source is assumed to be unique and the object type will be inferred.  Valid values are: CHPID, PORT, XCUI, CDI, CONVERTR, PATCHPRT.
Source Unique Key	Text EO	The unique key for the source object. Composed of "Table Name:Object Name".
<b>Target</b>	Text	The name of the object which ends this logically complete series. For example, 3990_#12/SC0/A.
Target Type	Enum	Object type qualifier for target. Follows the same rules as source type.  Valid values are: CCI, XCI, SI, PORT, CHPID, CONVERTR, PATCHPRT
Target Unique Key	Text EO	The unique key for the target object. Composed of "Table Name:Object Name".
Transmit Loss	Float	The transmit loss of the entire fiber link, in dB.  For series which are not composed of fiber cables: <ul style="list-style-type: none"> <li>• Import ignores the value.</li> <li>• Export places 0 in this field.</li> </ul> On import, the value 0 is treated as "N/A" (not available) by HCM.
Receive Loss	Float	The receive loss of the entire fiber link, in dB. Same considerations as transmit loss.

**Note:** This table is used in two ways:

1. On import, its only purpose is to update the transmit and receive loss values for a fiber link.
2. On export, each LOGLINK row serves as an anchor for one or more rows of the CONNECT table.

## Each LOGLINK Row Represents a "Logically Complete" Series

A series of connections is logically complete if it starts at a logical connection source and ends at a logical connection target. For fiber connections, this is usually equivalent to a fiber link. For example, the sequence of connections from PROC1, CHPID 30 to patchport A1C6, then from patchport A1C6 to 3990 #2/SC0/A is a logically complete series from PROC1/30 to 3990 #2/SC0/A.

The source and target columns identify the end points of a logically complete series.

**Valid Sources for a "Logically Complete" Series:** Think of a LOGLINK source as the electronics which send signals, the originator of the signal on this cable:

CHPIDs

PORTs (Switch ports, when used as control unit ports, or ports connecting to chained switches)

XCUIs (Crossbar control unit interfaces)

CDIs (Controller device interfaces)

CONVERTRs (the "bottom" of the converter. Both sides of the converter must be connected.)

PATCHPRTs (only when permanently connected on one side, and not connected on the other)

**Valid Targets:** Think of a LOGLINK target as the electronics which receive signals, the eventual destination:

CCIs (Controller channel interfaces)

XCIIs (Crossbar channel interfaces)

SIIs (String interfaces)

PORTs (Switch ports, when used as CHPID ports, or ports connecting to chained switches)

CHPIDs (when used in point to point CTC connections and Coupling Facility connections)

CONVERTRs (the "top" of the converter. Both sides of the converter must be connected.)

PATCHPRTs (only when permanently connected on one side, and not connected on the other)

**Note:** Not all combinations are possible or meaningful. For example, it is not possible to create a series between a string interface and a CHPID.

**Special Considerations for Daisy-Chained Connections:** Where daisy-chained connections are involved, the logically complete series will be between the source and the final destination at the end of the daisy chain. For example, a connection from CHPID 01 to 3172 #1 then daisy-chained to 3172 #2 would be represented by a LOGLINK between CHPID 01 and 3172 #2.

**Special Considerations for Converters:** Each converter in a chain of connections starts a new logically complete series. Thus, any LOGLINK that has a parallel source will have a parallel target. Any LOGLINK that has a serial source will have a serial target. Breaking up series based on converter positions is useful for two reasons:

1. It allows a LOGLINK which specifies transmit loss and receive loss values to associate those losses just with the serial portion of a chain of connections.
2. That fact that a chain of connections may "branch" at a parallel to serial (P->S) converter due to daisy chaining.

Consider the following example, in which a connection "branches" at a P->S converter such that two controller interfaces are reachable by one CHPID:

```
CHPID 01 ==== > /In P->S Converter ----> Serial Controller Interface (A)
               != < /Out
               !
               != > /In Parallel Controller Interface (B)
```

Read the above example as a sideways pictorial diagram. Double lines "====" are parallel, single lines "---" are serial.

In this case, there will be two logically complete series, and two LOGLINK records:  
From CHPID 01 to Interface B (because for daisy chains the target is the "final" one); and  
from the P->S Converter to Interface A.

As a further illustration, consider how many LOGLINK records would be needed if the daisy chaining were not to a parallel controller interface, but rather to another serial controller interface (via another P->S converter):

```
CHPID 01 ==== > /In P->S Converter ----> Serial Controller Interface (A)
               != < /Out
               !
               != > /In P->S Converter ----> Serial Controller Interface (C)
```

In this case, there will be three LOGLINK records:  
From CHPID 01 to the second P->S Converter.  
From the first P->S Converter to Interface A.  
From the second P->S Converter to Interface C.

**Order of Processing:** LOGLINK table is processed after all other records have been processed, regardless of their order in the import data stream. This is because the validity of the series depends on the existence and type of connections, some of which may not be mentioned until later in the import file.

### Connections from CHPIDs on OPPP Processors

When dealing with OPPP (One Processor Per Partition) style processors, it is possible to have more than one CHPID (from different logical processors) correspond to the same physical channel path number. That physical channel path may be connected to something. In that case, export will only produce one LOGLINK record for that path. Consider a case in which two CHPIDs map to the same path. The single, exported LOGLINK record will contain the CHPID source identification of one of the two CHPIDs. No other LOGLINK record is required because the connectivity of the second CHPID can be inferred from the connectivity of the first, since the physical manifestation as a path is shared.

If you are creating files for import you should use the same philosophy as that used by export, and avoid entering more than one LOGLINK record per path.

The same applies to CONNECT records, described below. That is, for each path, there should be only one CONNECT record that lists a CHPID on that path as its source.

## CONNECT Table

Table 30. CONNECT Table

Field Name	Format	Description
<b>Table Name</b>	<b>Text</b>	<b>CONNECT</b>
<b>Source</b>	Text	The name of the source of this connection. This field is composed of the object name, followed by an optional qualifier for those objects such as patchports which have two interfaces (front and back). See "Source and Target Optional Qualifiers" on page 326
Source Type	Enum	<p>Object type qualifier (table name) for the source. This is only necessary if the source does not uniquely identify a connectable object (for example, it is legal to have a processor named A1 and an ESCON switch also named A1, so A1/D2 could be a CHPID or a PORT; in such a case source type must be supplied to distinguish which of the two objects is being connected). If it is supplied, source must identify an object of the given type.</p> <p>If omitted, the source is assumed to be unique and the object type will be inferred.</p> <p>Valid values are: CHPID, PORT, XCUI, CDI, CONVERTR, PATCHPRT. Also valid (for daisy-chaining support) are: CCI, SI, XCI.</p>
Source Unique Key	Text EO	The unique key of the source object. Composed of "Table Name:Object Name".
<b>Target</b>	Text	The name of the target of this connection. Follows the same rules as Source.
Target Type	Enum	<p>Object type qualifier (table name) for the target. Follows the same rules as source type.</p> <p>Valid values are: CCI, XCI, SI, PORT, CHPID, CONVERTR, PATCHPRT.</p>
Target Unique Key	Text EO	The unique key of the target object. Composed of "Table Name:Object Name".
LOGLINK Target Unique Key	Text EO	<p>The unique key of the target object in the logically complete series which contains this connection. All connections in a logically complete series have the same value for this field.</p> <p>This field, along with the sequence field, enables a report program to collect the individual connections in a logically complete series.</p>
Sequence	Num EO	The sequence of this connection in the logically complete series. Connections are numbered from the bottom up (from the target to the source), starting with 1.

Table 30. CONNECT Table (continued)

Field Name	Format	Description
Cable ID	Text	<p>The cable ID to be used for this connection. The specified cable must exist in the configuration, and its cable type must be compatible with this connection.</p> <p>If the cable is already used in another connection, it will be reassigned to this connection. The previous connection will not be broken.</p> <p>If this field is omitted, mutable connections will be made without a named cable, and permanent connections will be made with an anonymous trunk.</p>
Permanent	Bool	Yes will mark this connection as permanent.

**Note:** The sequence field is numbered from the target towards to source. It could have been done the other way around. The target to source sequence was chosen since in HCM, you always connect targets to sources, and usually view connections (fiber links) from the target's perspective. To maintain consistency with HCM base, the sequence starts at the target and looks upwards.

Each row in the CONNECT table represents a discrete connection between two adjacent objects, a connection which can be described with a single cable. A logically complete series (LOGLINK) is often composed of several CONNECTS. For example, the sequence of connections from PROC1, CHPID 30 to patchport A1C6, then from patchport A1C6 to 3990 #2/SC0/A requires two CONNECT rows:

PROC1/30 to patchport A1C6/back, and  
patchport A1C6/front to 3990 #2/SC0/A

The LOGLINK table serves as a means to associate these two connection records. The LOGLINK table, with the sequence field of the CONNECT rows, is sufficient to report on the complete sequence of connections from the original source to the eventual target.

The source and target columns identify the end points (interfaces) of the connection. Before making the connection, HCM will remove current connections from the objects if necessary.

## Source and Target Optional Qualifiers

Some objects have more than one possible cable connection. In these cases, an additional qualifier is necessary to precisely indicate the interface. These qualifiers are:

- For patchports:  
/front (or just /f)  
/back (or just /b)  
The /front or /back qualifier is always required for CONNECTs involving PATCHPRTs.
- For interfaces which can be daisy-chained, including parallel interfaces and string interfaces:  
/in  
/out  
If this qualifier is absent during import, HCM assumes /in.

### Notes:

1. Including /in and /out makes it easier to understand reports generated from export data.
2. The slash "/" used in the examples above is meant to represent the concatenator character, for which you can select a different symbol.

## Valid Sources and Targets

Sources and targets are any interfaces that can be connected to HCM. The following are valid sources or targets:

- CHPIDs
- PORTs
- XCUIs (Crossbar control unit interfaces)
- CDIs (Controller device interfaces)
- PATCHPRTs (always qualified with /front or /back)

The following are daisy-chained connections proceeding onwards from a parallel interface:

- XCIs (Crossbar channel interfaces, optionally qualified with /out)
- CONVERTRs (may be qualified with /in or /out if it is the top of a parallel->serial converter)
- CCIs (Controller channel interfaces; if they are bus-and-tag, they may optionally be qualified with /in or /out)
- SIs (String interfaces, optionally qualified with /out)

If you use OPPP (One Processor Per Partition) style processors, you should only create one CONNECT record per physical channel path in your import files, even if the path is shared by more than one CHPID. You can find more information in the “LOGLINK Table” on page 322 under “Connections from CHPIDs on OPPP Processors” on page 324. Export automatically restricts its output so that there is only one CONNECT record per physical channel path.

Regardless of the type of connection, the following general rules apply:

- An object may not be connected to itself.
- The interface types (parallel, serial, ...) of the source and target must match.
- A connection source, or target, with explicit or defaulted qualifiers, may appear only once in the CONNECT table.
- A cable ID may appear only once in the CONNECT table.
- Converter connections are only honored if they complete a connection from a signal source (e.g. CHPID or PORT) to a receiver (e.g. XCI or CCI).

## Connections Involving Ports on Switches

Physical connections involving ports on switches are present in both the PWS file and the IODF. For every physical connection or disconnection caused by the import file, appropriate changes will also be recorded in the IODF. HCM will update the Port<>CU, Port<>CHPID, and Port<>Port links in the IODF in a similar manner to the actions which would have been taken if you had connected or disconnected using the standard HCM user interface.

**Note:** All IODF updates are confirmed by you. See “General Concept on IODF Update Processing” on page 290 for more information.

## Order of Processing

The CONNECT table is processed before the LOGLINK table, and after all other tables have been processed, regardless of their order in the import file. This is because connections depend on the existence and type of interfaces and cables, some of which may not be mentioned until later in the import file.

## PPRCLINK Table

Table 31. PPRCLINK Table

Field Name	Format	Description
Table Name	Text	PPRCLINK
Source Interface	Text	The interface of the primary subsystem that is involved in the PPRC link.
Source Control Unit	Hex	The control unit of the primary subsystem that is involved in the PPRC link.
Target Control Unit	Hex	The control unit of the secondary subsystem that is involved in the PPRC link.
Link Address	Text	The two-digit link address used for the PPRC connection if the connection involves a switch.
CUADD	Text	The CUADD value (two-digit hexadecimal number) used for the PPRC connection.
Description	Text	The description of the PPRC link.
DEVN	Text	Four-digit hexadecimal number indicating the target device of CESTPATH commands, also provided by the user when creating or editing a PPRC connection. This should be a device within the primary subsystem.
Primary SSID	Text	The subsystem ID of the primary subsystem.
Secondary SSID	Text	The subsystem ID of the secondary subsystem.
Link	Text	This 8-digit hexadecimal number has a format borrowed from host-based PPRC tools: 'SSSSLCC' where SSSS is the four-digit System Adapter Identifier (SAID), LL is the two digit link address, and CC is the two-digit destination LCU (i.e. CUADD).

## DEVCU Table (Export-Only)

Table 32. DEVCU Table (export-only)

Field Name	Format	Description
Table Name	Text	DEVCU
Device ID	Text EO	<IODF Key> The ID of the IODF object. Normally the device number, but may be further qualified as described for the ID field of the DEVICE table.
CU ID	Hex EO	<IODF Key> The ID of the IODF object.

**Note:** This table is provided to facilitate the use of export files to create reports on logical connectivity of devices to control units.

## CUCHPID Table (Export-Only)

Table 33. CUCHPID Table (export-only)

Field Name	Format	Description
Table Name	Text	CUCHPID
CU ID	Hex EO	<IODF Key> The ID of the IODF object.
CHP ID	Text EO	<IODF Key> The ID of the IODF object, formatted as described in the CHPID table for the ID field.
DLA	Hex EO	Dynamic link address, valid only if the DLA Set field evaluates to a Yes.
DLA Set	Bool EO	Yes if there is a dynamic link address (DLA).

**Note:** This table is provided to facilitate the use of export files to create reports on logical connectivity of control units to CHPIDs.

## DEVIMAGE Table (Export-Only)

Table 34. DEVIMAGE Table (export-only)

Field Name	Format	Description
Table Name	Text	DEVIMAGE
Device ID	Text EO	<IODF Key> The ID of the IODF object. Normally the device number, but may be further qualified as described for the ID field of the DEVICE table.
Image ID	Text EO	<p>&lt;IODF Key&gt;</p> <p>For images on BASIC mode processors, consists of a processor ID (for example, PROC1).</p> <p>For images on LPAR mode processors, consists of a processor ID, a separator, and a logical partition name (for example, PROC1/LPAR1).</p> <p>The presence or absence of a separator in this field can thus be used as an indicator of what type of image this is.</p>
Link type	Enum EO	<p>Valid values are:</p> <p><b>A</b> Device reaches image via a CHPID that has that image in its access list.</p> <p><b>C</b> Device reaches image via a CHPID that has that image in its candidate list.</p> <p><b>-</b> Device reaches image via a CHPID that has that image in either its access or candidate list, but the image is not in the device's explicit candidate list.</p> <p><b>+</b> Device does not connect to any CHPID that has this partition in its access or candidate list, yet the device's explicit candidate list includes that image.</p>

**Note:** This table is provided to facilitate the use of export files to create reports on logical connectivity of devices to images (taking into account any explicit candidate lists). Normally, this table can be exported regardless of whether you are running in standalone or online mode. However, if the configuration has devices which are connected to a processor via a reconfigurable (REC) CHPID, communication with the host is required in order to determine whether the processor model is EMIF capable or not. In online mode, the communication takes place automatically and transparently. In standalone mode, you will see an appropriate error message indicating that the attempted operation is not permitted in standalone mode. The name of the table currently being exported appears in the status bar, so you will know which table required host access.

---

## Chapter 16. Providing Input to the Tivoli Inventory Data Base

Tivoli Inventory is a hardware and software inventory gathering application for the Tivoli Framework, designed to help system administrators and accounting personnel manage their client/server environment. With Tivoli Inventory it is possible to gather and maintain hardware and software information for every node in a Tivoli Management Region. HCM provides optional Tivoli Inventory support by making HCM exported data accessible to Tivoli Inventory. In particular, HCM exported data can be converted into a format that can be read by Tivoli Inventory scans, and thus HCM data can be maintained in the Tivoli Inventory database.

For information on installation prerequisites, refer to “Prerequisites” on page 3.

---

### Updating the Inventory Database Definition for HCM Exported Data

During the HCM installation (see Chapter 2, “Installing HCM” on page 3), the following files for Tivoli Inventory support have been copied to the ...\\MIFUTIL directory. MIFUTIL is a sub directory of the installation directory you specified during the installation process. The default for the installation directory is \\IBMEEQ. The files which belong to the Tivoli Inventory support are listed in Table 35.

*Table 35. Files for Tivoli Support*

[Drive]:\\IBMEEQ\\MIFUTIL\\EEQ2MIF.EXE	Conversion tool
[Drive]:\\IBMEEQ\\MIFUTIL\\EEQ2TMEM.SQL	SQL script for MS SQL
[Drive]:\\IBMEEQ\\MIFUTIL\\EEQ2TMES.SQL	SQL script for Sybase
[Drive]:\\IBMEEQ\\MIFUTIL\\EEQ2TME0.SQL	SQL script for Oracle
[Drive]:\\IBMEEQ\\MIFUTIL\\EEQ2TMED.SQL	SQL script for DB2
[Drive]:\\IBMEEQ\\MIFUTIL\\TABLDESC.TXT	Tables that store HCM exported data

The database tables predefined by Tivoli Inventory are not designed to hold host hardware configuration data. Run the EEQ2TMEx.SQL script suitable for the used RDBMS to extend the Tivoli Inventory database schema with host hardware configuration data. Perform the following steps:

1. Copy the appropriate SQL script to your database server.
2. Log on to the inventory database as database owner or database administrator.
3. Invoke the SQL script. The script creates all necessary tables for the HCM exported data. For a description of these tables and its columns please refer to “Table Description” on page 338. How to invoke the SQL script depends on the database system and the database tools you have installed. See the *Tivoli Inventory 3.2 User’s Guide* for more information.

The basic database configuration that is created by Tivoli’s SQL scripts is a minimal configuration. In most cases, the database size will be too small to hold large hardware configurations exported by HCM. Ask your database administrator to adjust the sizes according to the amount of data you want to store. Since large hardware configurations will also cause large database transactions to populate the appropriate database tables, you additionally must increase the size of the rollback spaces.

The performance of HCM Tivoli Inventory support mainly depends on the performance of the used database when processing large transactions. Therefore, it is strongly recommended to choose appropriate database parameters to get the best possible performance. See your database documentation and ask your system administrator.

## Customizing an Inventory Profile for Custom MIF File Scan

Tivoli Inventory gathers information about HCM data by scanning MIF files. The conversion tool creates these files by converting the HCM exported files to MIF format. You have to create and then customize a Tivoli Inventory profile which starts the conversion tool on your HCM workstation and scans the produced MIF files. To create a Tivoli Inventory Profile, start the Tivoli desktop on the TMR server, open the appropriate policy region and profile manager, and choose **Create->Profile...** from the menu in the profile manager window. Select **InventoryProfile** as profile type. For more information about customizing a Tivoli Inventory profile see the *Tivoli Inventory 3.2 User's Guide*. The following figure shows a sample of the **Customize Inventory Profile** window.

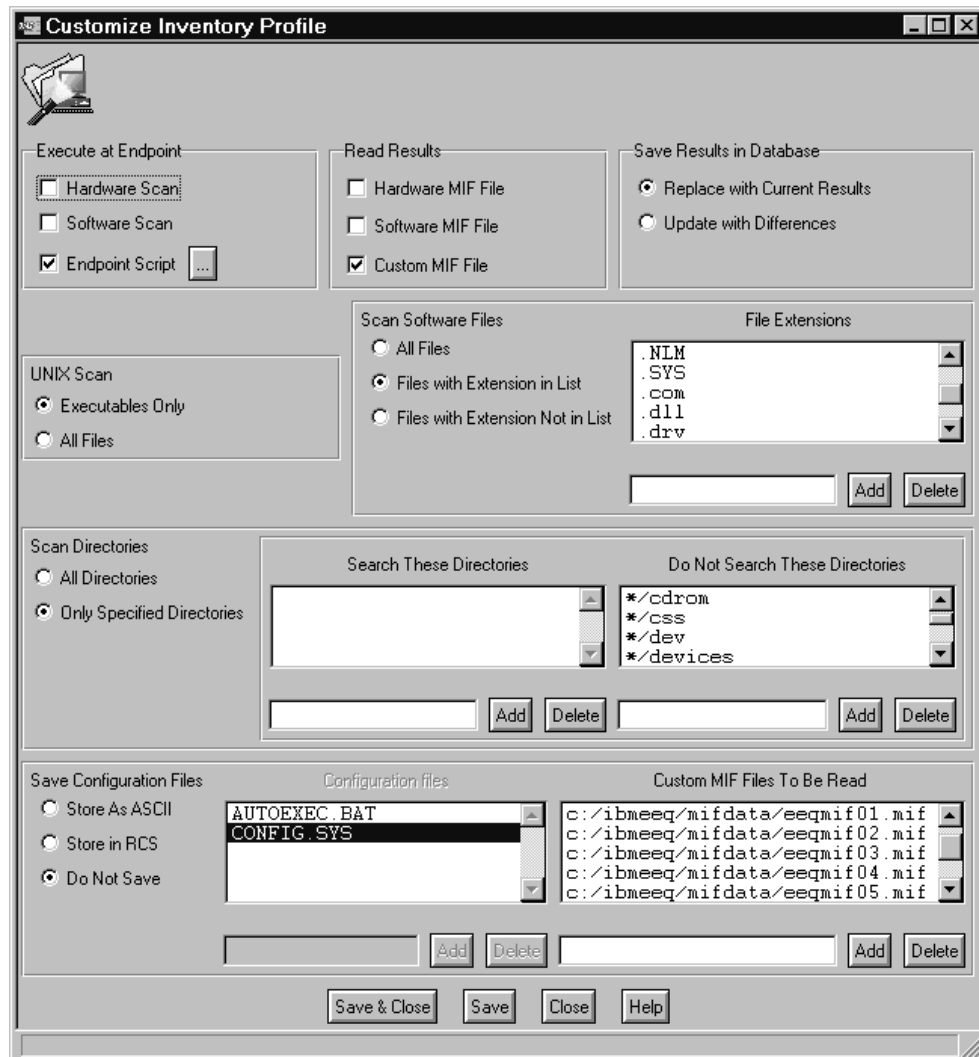


Figure 147. Customize Inventory Profile

You have to make the following settings:

- Inventory must start the conversion tool at the HCM workstation. Therefore, an endpoint script must be executed. In the **Execute at Endpoint** box select **Endpoint Script**. The endpoint script must contain the following statement:

```
[Drive]:\IBMEEQ\MIFUTIL\EEQ2MIF [Option] [String]
```

IBMEEQ is the default installation directory for HCM. If you have chosen a different directory during installation you must replace IBMEEQ accordingly. See “Invoking the Conversion Tool” on page 336 for an explanation of the [Option] and [String] parameter.

Switch off **Hardware Scan** and **Software Scan**.

- If you want to submit any other commands you can include them in the endpoint script as well. For example, you can run the following commands before starting the conversion tool to make sure that all obsolete MIF files are deleted before creating the new files.

```
attrib -R [Drive]:\IBMEEQ\MIFDATA\*.MIF
del [Drive]:\IBMEEQ\MIFDATA\*.MIF
```

The endpoint script is a batch file which is executed at the endpoint. For further information see the *Tivoli Inventory 3.2 User's Guide*.

- The following figure shows an example of an endpoint script:

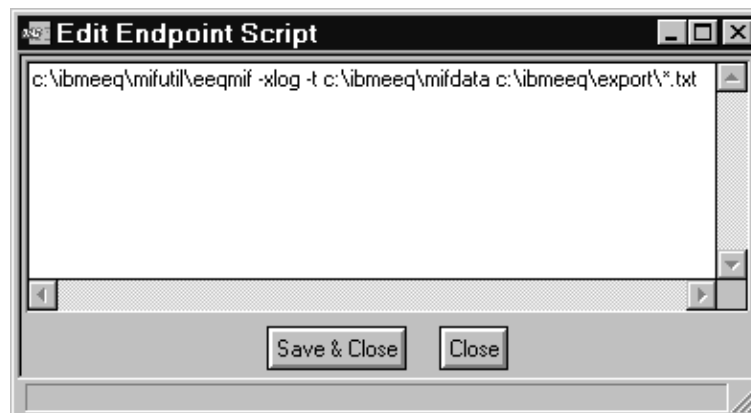


Figure 148. Example of Endpoint Script

- In the **Read Result** box choose **Custom MIF File**. Switch off the **Hardware MIF File** and **Software MIF File**.
- See the *Tivoli Inventory 3.2 User's Guide* for the appropriate setting of the radio buttons in the **Save Results in Database** box.
- As you only scan a custom MIF file, the group boxes **UNIX Scan**, **Scan Software Files** and **Scan Directories** are not relevant.
- In the **Save Configuration Files** choose **Do Not Save**.
- In the **Custom MIF File to be Read** box add the absolute path to your target directory and the file names of the MIF files to be scanned. The MIF files are named EEQMIFxx.MIF, where xx are the two digit hexadecimal numbers from 00 to 19.
  - [Drive]:\IBMEEQ\MIFDATA\EEQMIFxx.MIF

[Drive]:\IBMEEQ\MIFDATA is the default target directory for the MIF files produced by the conversion tool. If you have specified a different directory in the endpoint script (eeq2mif.exe invocation) you must replace the default path here.

- Click **Save & Close** to save your profile and leave the profile definition dialog.

To distribute the customized profile, click on **Profile Manager** from the menu bar and select **Distribute** from the pull down menu, or just drag & drop the profile icon to the subscriber icon. The subscriber to where you distribute your profile must be the HCM workstation. If your HCM workstation is not already a subscriber to the profile you can subscribe it by dragging its icon from the policy region to the profile manager's subscribers area. When running the scan, the endpoint script will be executed which invokes EEQ2MIF.EXE. EEQ2MIF will convert the specified HCM exported files to MIF file format (Before scanning, data has to be exported by HCM, see "Exporting Data from HCM for Tivoli Inventory Support" on page 335). Tivoli Inventory reads these MIF files and the data is placed in the Tivoli Inventory database in the corresponding database tables. Tivoli Inventory queries can be added to an existing or a new query library. These queries can then be used to retrieve certain data from the HCM tables.

There are several ways to check if the scan has run through:

- Check the conversion tool log file for any error or warning messages that have been issued. The log file is located in the target directory.
- Check the Tivoli Inventory notice group for messages.
- The column CONFIG\_CHANGE\_TIME in all HCM tables in the inventory database is an indicator when the last scan has written data to the database.

If an error occurs during the scan process, this information can be used to determine which component caused the problem.

Because the workstation ID is by default a primary key for the HCM tables in the Tivoli Inventory database there can be only one set of HCM exported data for each HCM workstation. With each new scan the HCM data in the Tivoli Inventory database is replaced by the last exported HCM data. The exact behavior on how Tivoli Inventory handles results from scans depends on the **Save Result in Database** selection in the Tivoli Inventory Profile. Refer to the *Tivoli Inventory 3.2 User's Guide* for more information.

---

## Creating a Query

In order to view the information Tivoli Inventory has scanned, customize a Tivoli Inventory query. Perform the following steps:

1. If you have not already created a query library, do the following: From the Tivoli Inventory desktop open the Policy Region in which you want to create the QueryLibrary and choose **Create->QueryLibrary** from the menu.
2. Open the query library and choose **Create->Query** from the menu.
3. In the Edit query dialog type in the name of the HCM table from which you want to retrieve information. Select one or more columns from the column list. For an overview of the HCM table definitions see "Table Description" on page 338. To specify the data more precisely you can also enter a "where" clause.
4. Once you have customized the query to your needs you can save and run it.

Tivoli Inventory will display the retrieved data in a result window.

## Exporting Data from HCM for Tivoli Inventory Support

The conversion tool EEQ2MIF.EXE converts HCM exported data to MIF file format. It is necessary to export your HCM data before starting a custom MIF file scan each time your configuration has changed. The directory to which you export your data must be the same you have specified as source directory for the conversion tool. Export your HCM configuration data as follows:

Start HCM on your workstation and open the IODF from which you want to export data.

From the File menu choose **File->Export Data...**

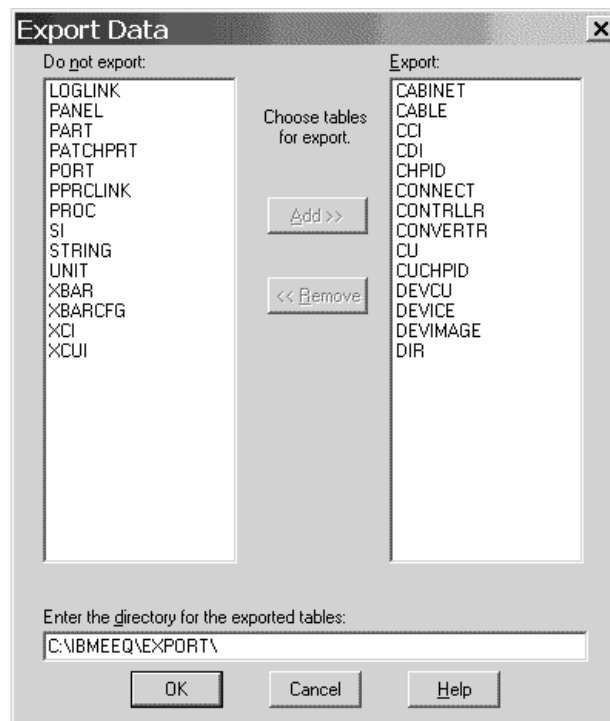


Figure 149. Export Data Dialog

Add the tables you want to export to the Export list. Enter a valid path for your exported data files and click **OK**. The path must be the same as the specified source directory for the conversion tool.

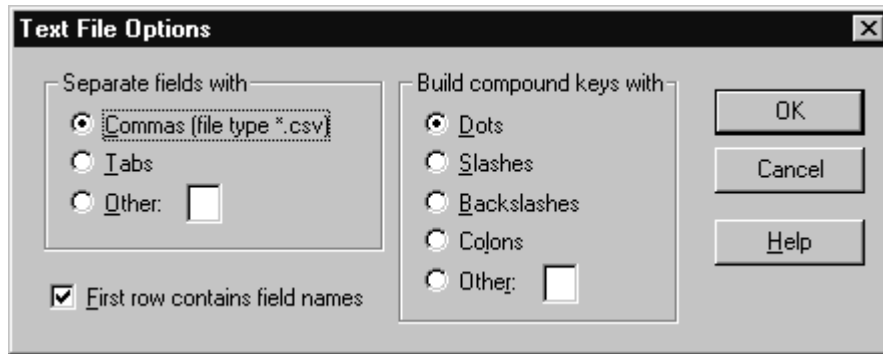


Figure 150. Text File Options Dialog

Only commas as delimiters are supported by the conversion tool. You must choose **Comma** in the **Separate fields with** box. As the conversion tool needs the field names as input you must select the **First row contains field names** box. The **Build compound keys with** box is not relevant. Click the **OK** button to confirm your choices.

HCM now exports your hardware configuration data into the specified directory. For each table a separate file is created. For a detailed description of the file and tables format see Chapter 15, “Importing and Exporting Data” on page 283.

#### Tip

It is not necessary to export all available tables. You can omit all tables in which you are not interested. It is recommended to omit the tables CUCHPID, DEVCU, and DEVIMAGE. If you want to store large hardware configurations, the performance is significantly improved when you omit these tables.

## Invoking the Conversion Tool

The endpoint script must contain a command to invoke the conversion tool. The syntax of this command has the following form:

```
EEQ2MIF [Option] [String]
```

EEQ2MIF.EXE converts information from the specified HCM exported files into a set of MIF files. If all specified source files can be converted without errors, the files EEQMIFxx.MIF (with xx in the range of hexadecimal numbers from 00 to 19) will be created in the target directory. Each MIF file corresponds to one HCM exported file. If an HCM exported file is empty or not available (in case of wildcard usage), the respective MIF file will be created but will contain no data records.

If an error occurs during conversion, the MIF files EEQMIFxx.MIF in the target directory will be renamed to EEQMIFxx.MI~. The new extension prevents Tivoli Inventory from reading inconsistent MIF files. Tivoli Inventory will stop the processing of the distributed profile and report that some MIF files cannot be read. Take a look into the log file of the conversion tool to check the messages.

## Option

[Option] is an optional parameter and refers to the available options the routine can be started with.

These options concern the following:

- The building of a log file EEQ2MIF.LOG containing status and diagnostic messages which may occur during the conversion process
- The specification of a target directory for the produced MIF files and log file
- An available help function to show all possible options which can be specified

Available options are:

**[Option] = -xlog**

An extended version of a log file is produced

**[Option] = -t [Target]**

This option specifies a target directory [Target] the produced MIF files and log file are to be written to. The default target directory is ..\MIFDATA\ relative to the directory in which HCM resides. If no target option is given, the MIF and log file will be written to this default directory.

The target directory [Target] has to be specified in the following manner:

[Target] = [Drive]:\[Dir]\...\...\

where [Drive] denotes a valid drive letter and [Dir] a directory name. You can omit the ending backslash \.

If the target directory does not exist it will be created.

**[Option] = -? , -help**

This option invokes a help function which displays a help message on the screen. Use this option only if you invoke the conversion tool manually.

If the -help or -? option is stated a possibly following [String] statement is not considered.

You can also invoke these options with /[Option] instead of -[Option].

## String

[String] is a required parameter and locates the HCM exported files to be read. You can define [String] in the following ways:

- [String] = [Drive]:\[Dir]\...\...\

All files in this directory will be processed

- [String] = [Drive]:\[Dir]\...\[File]

The file [File] in the specified directory will be processed. [File] may contain wildcards (see below).

- [String] = [File]

The file [File] in the current directory will be processed.

[File] may contain wildcards in the following way:

[File] = \*.\*[Ext]

where [Ext] denotes any file extension.

---

## Table Description

The tables that were added to the inventory database in order to store the HCM exported data are described in Appendix F, “Table Description for Tivoli Inventory Support” on page 381. The tables are also stored in the product directory [Drive]:\IBMEEQ\MIFUTIL\TABLDESC.TXT.

---

## Chapter 17. Physical Description Files (PDFs)

Controllers and strings come in various physical arrangements. In some cases there are alternate physical arrangements available for the same unit type. HCM uses *physical description files* (PDFs) to represent the non-default physical arrangements of controllers and strings. A default controller is one that has one or more channel interfaces, one segment, and one device interface. It cannot be grouped with other controllers. A default string is one that has one interface and eight devices per unit.

A PDF is an ASCII text file containing one or more (usually one) physical descriptions for controllers or strings. The physical description is a template of an object hierarchy that can be used to characterize a controller (or set of controllers) or a string.

**Note:** The filename extension for physical description files was changed from ".pdf" to ".txt" for HCM 2.9 Service Level 3 and higher. Nevertheless, HCM 2.9 Service Level 3 and higher can still read physical description files having the extension ".pdf".

---

### Loading PDFs

PDFs are stored on the PWS disk where HCM is installed. Controller PDFs are in the following directories: CPDFA, CPDFB, CPDFC. String PDFs are in the following directories: SPDFA, SPDFB, SPDFC. The prefix 'C' or 'S' designates controller or string. The final 'A', 'B', or 'C' determines the precedence given to PDFs during an IODF load or resync (for more details, see "How PDFs are Assigned to Objects" on page 57). HCM loads all PDFs from these directories when a new configuration is created or an existing one is opened.

---

### Customizing PDFs

PDFs can be changed and new PDFs can be added to the appropriate directories as needed. Changes to PDFs do not take effect until the next time an HCM configuration is created or opened. If a PDF for an existing controller or string is changed (e.g. the maximum number of channel interfaces on a controller segment is increased or decreased), then any further changes to the physical arrangement of that piece of equipment will be constrained by the new PDF.

#### Notes:

1. Changing a PDF never causes physical changes to a controller or string automatically.
2. The easiest way to create your own PDF is to copy an existing PDF that is close to your needs. Then modify the copied PDF according to your needs, for example, adjust the number of segments or interfaces. Save your modified PDF file for example in one of the directories CPDFA or SPDFA, depending on whether you have modified a controller or string PDF. Load your HCM configuration file, and apply now the new PDF to all objects to which you want to apply it.
3. Do not store your private changed or modified PDFs in the 'B' directory. An installation of a new HCM version or service level might reset all your private changes and activities of PDFs.

---

## PDF Syntax

In PDFs, an exclamation mark (!) indicates the beginning of a comment; parsing resumes on the next line. Indentation is recommended but not necessary for parsing. Recognition of keywords is not case-sensitive (i.e. they may be in mixed upper or lowercase). Labels will be stored as they appear in the PDF (the parser does not convert labels to upper or lowercase). Labels can contain spaces if they are enclosed in double quotes.

Brackets [ ] indicate an optional clause.

Braces { } indicate a choice of entry; unless a default is indicated, you must select one of the entries.

Items separated by a vertical bar | represent alternative items. Select one of these items.

An ellipsis (...) indicates that multiple entries of the type immediately preceding the ellipsis are allowed.

Parentheses (not-bolded) are used to enclose clauses of which multiple entries are allowed.

CAPITAL LETTERS (including punctuation) indicates the exact characters to be entered. Such items must be entered exactly as illustrated, except that letters can be upper case or lower case.

CAPITAL LETTERS UNDERSCORED indicates a default value that is used if you omit the clause.

---

## Controller PDF Syntax

A controller PDF is an ASCII text file that contains one or more controller physical descriptions. A controller physical description has the following syntax.

```

SUBSYSTEM = label
[ABBREVID = id]
UNITTYPE = unit
  CLASS = { DASD | TAPE | TERMINAL | "UNIT RECORD" |
            TELECOMMUNICATIONS | MICR/OCR | GRAPHICS |
            OTHER | "ESCON CTC" }
  [COMGROUP = {TRUE | FALSE}]
  [CANGROUPADAPTERS = {TRUE | FALSE}]
  [OWNSALLDEVICES = {TRUE | FALSE}]
  [INTEGRATED = {TRUE | FALSE}]
( CONTROLLER [= label]
  [ [ALLOW {number | (number[,number]...)}]
  [DEFAULT number]
SEGMENTS
  ]

( SEGMENT [= label]
  [ALLOW {number | (number[,number]...)}]
  [DEFAULT number]
CUINTS = ( label [[number]] [,label [[number]]]... )

[ALLOW {number | (number[,number]...)}]
[DEFAULT number]
DEVINTS = ( label (,label)... )
)...
)...

```

For controllers that have multiple channel interfaces per channel adapter, the syntax of the SEGMENT clause is as follows:

```

SEGMENT [= label]
[ALLOW {number | (number[,number]...)}]
[DEFAULT number]
CAS
  ( CA [= label]
    [ALLOW {number | (number[,number]...)}]
    [DEFAULT number]
    CUINTS = ( label [,label]... )
  )...

[ALLOW {number | (number[,number]...)}]
[DEFAULT number]
DAS
  ( DA [= label]
    [ALLOW {number | (number[,number]...)}]
    [DEFAULT number]
    DEVINTS = ( label (,label)... )
  )...

```

The ALLOW clause lists the possible numbers of sub-objects that can be created. When an ALLOW clause is present, the maximum allowed number must match the number of sub-object definitions that follow.

The DEFAULT clause specifies the number of sub-objects that are created initially. If there is no default clause, then the first allowed value is used. If there is no ALLOW clause then the default is the number of sub-object definitions that follow.

The allowed values for subsystem attributes are:

*Table 36. Controller PDF Attributes*

Attribute	Allowed Values	Description
ABBREVID	String of up to 8 characters	An optional identifier that can be used to select a particular physical description during IODF load or re-synchronization.
UNITTYPE	String of up to 13 characters	A valid control unit type (required) and model (optional).  (e.g. "3990-3")
COMGROUP	TRUE or FALSE	If TRUE, can be grouped via communicator cables. Default: "FALSE".
CANGROUPADAPTERS	TRUE or FALSE	If TRUE will respond to the HCM view preference that causes channel adapters and device adapters to be grouped together by adapter number. The default value is FALSE.
OWNSALLDEVICES	TRUE or FALSE	If TRUE controllers of this PDF are the sole owners of their devices. Used during IODF load and resynchronization to match controller segments. The default value is FALSE.

The standard IBM PDF for 3990-3 controllers is as follows:

```
SubSystem = "IBM 3990 Model 3 DASD Controller"
UnitType = "3990-3"
Class = "DASD"
OwnsAllDevices = True
Controller
  Allow 2 Segments
  Segment = "SC0"
  Allow (2,4,6,8) Default 4 CuInts=(A,B,C,D,E,F,G,H)
  Allow 2 DevInts=(SP0,SP1)
  Segment = "SC1"
  Allow (2,4,6,8) Default 4 CuInts=(A,B,C,D,E,F,G,H)
  Allow 2 DevInts=(SP2,SP3)
Controller
  Allow 2 Segments
  Segment = "SC2"
  Allow (2,4,6,8) Default 4 CuInts=(A,B,C,D,E,F,G,H)
  Allow 2 DevInts=(SP0,SP1)
  Segment = "SC3"
  Allow (2,4,6,8) Default 4 CuInts=(A,B,C,D,E,F,G,H)
  Allow 2 DevInts=(SP2,SP3)
```

---

## String PDF Syntax

A string PDF is an ASCII text file that contains one or more string physical descriptions. A string physical description has the following syntax.

```

STRING = label
[ABBREVID = id]
UNITTYPE = unit
[COLUMNS = number]
[TWOHEADED = {TRUE | FALSE}]

[ (DEFAULT | EXACTLY) number UNITS ]

( UNIT [= label] (
DEVICES = number |...
DEVICERANGE = (position,count) [,(position,count)]...
)...

[ALLOW {number | (number[,number]...)}]
[DEFAULT number]
HOSINTS = ( label (,label)... )

```

## Explanation of PDF changes

### DEFAULT

The DEFAULT clause for the number of units indicates the number of units the string is created with. If the EXACTLY clause is used, this number does not change during the string is installed. The number of the unit definitions must be equal or larger as the number specified in the clause - if EXACTLY is used, no unit definitions are allowed.

### DEVICES DEVICERANGE

The DEVICES and DEVICERANGE clauses in the unit definitions specify either a count of devices or ranges of devices. Each range of devices owns a position and count. If the first unit definition uses the DEVICES keyword, all subsequent unit definition must use the DEVICES keyword. In the same way, if the first unit uses DEVICERANGE, all subsequent units must use DEVICERANGE. These definitions control the assignment of I/O device numbers to units when the string is created or when devices are added to the string. If the DEVICES keyword is used, new devices will be assigned to units in the string sequentially - each unit owns the specified number of devices. If DEVICERANGE is used, the position of the device in a sequence of new device numbers being added to the string will be compared with the DEVICERANGE definition for the units to determine which unit the device should be added to.

The allowed values for string attributes are:

Table 37. String PDF Attributes

Attribute	Allowed Values	Description
ABBREVID	String of up to 8 characters	An optional identifier that can be used to select a particular physical description during IODF load or re-synchronization.
UNITTYPE	String of up to 13 characters	A valid device type (required), e.g. "3390"
COLUMNS	Positive integer	A number indicating the number of units in each row (default is 1).
TWOHEADED	TRUE or FALSE	If TRUE, the string is drawn with two strings of units and two sets of interfaces. The default value is FALSE.

The IBM PDF for 3390 strings is as follows:

```
String = "IBM 3390 all models"
UnitType = "3390"
Default 3 Units
    Unit    Devices=8
    Unit    Devices=12
    Unit    Devices=12
```

Allow (4) Default 4 hosInts=(A,B,C,D)

The IBM PDF for IBM RAMAC Array DASD is as follows:

```
String = "IBM RAMAC Array DASD"
AbbrevId = "RAMAC"
UnitType = "3390"
Columns = 2
Exactly 16 Units
    Unit DeviceRange=(30,2)
    Unit DeviceRange=(28,2)
    Unit DeviceRange=(26,2)
    Unit DeviceRange=(24,2)
    Unit DeviceRange=(22,2)
    Unit DeviceRange=(20,2)
    Unit DeviceRange=(18,2)
    Unit DeviceRange=(16,2)
    Unit DeviceRange=(14,2)
    Unit DeviceRange=(12,2)
    Unit DeviceRange=(10,2)
    Unit DeviceRange=(8,2)
    Unit DeviceRange=(6,2)
    Unit DeviceRange=(4,2)
    Unit DeviceRange=(2,2)
    Unit DeviceRange=(0,2)
```

Allow 4 hosInts=(A0,A1,A2,A3)

This indicates that a RAMAC string contains 16 units arranged in two columns in the diagram, and that the first two devices (0 and 1) are assigned to the ninth unit (fifth row and first column), and so on.

---

## Chapter 18. Problem Determination

The information in this chapter is intended to help you diagnose problems that may arise from using HCM. It explains:

- How to identify problems
- What diagnostic information and tools you can use
- How to search problem reporting data bases

---

### Identifying and Handling Problems

The basic strategy for handling problems is as follows:

- Identify problem
- Diagnose problem
- Collect problem data, if applicable
- Analyze problem data
- Develop search argument
- Report problem to IBM
- Identify a problem source

More information on how to proceed in handling a problem can be found in

*z/OS MVS Diagnosis: Procedures*

*z/OS MVS Diagnosis: Reference*

*z/OS MVS Diagnosis: Tools and Service Aids*

Errors may occur while:

- Installing HCM at the workstation.
- Establishing a communication between the workstation and HCD at the host.
- Communicating with HCD at the host.
- Processing an HCM action
- Drawing the configuration diagram

The following topics are discussed:

- "Application Error" on page 346
- "Fatal Error at Workstation" on page 346
- "Abnormal Termination of HCD Host" on page 349
- "Communication Problems Using APPC" on page 346
- "Communication Problems Using TCP/IP under z/OS" on page 347
- "Communication Problems Using APPC" on page 346 and "Communication Problems Using TCP/IP under z/OS" on page 347
- "Message Problems" on page 347
- "Incorrect Results" on page 348
- "Incorrect Configuration Diagram" on page 348
- "Problems Printing Reports/Configuration Diagrams" on page 348
- "Incorrect Help Information" on page 351
- "Problems with HCM User's Guide" on page 350
- "Installation Problems" on page 351

Messages are the primary means by which HCM informs you that an error occurred. The message is either issued by HCM or originated from the HCD host. In some cases, an HCD message identifies errors reported by other products.

## Product Identifiers

Module prefix: *EEQ*  
Component ID: *5797-11900*

For more information on identifiers, refer to the *z/OS Program Directory*.

## Application Error

An application error is a severe error that might occur while working with HCM. It causes the operating system to display a process exception with various information where the error occurred. From the information displayed, record the following:

- Type of exception (for example, general protection fault)
- Failing module
- Location within failing module
- Dr. Watson log file (if available)

and report the problem to the IBM Support Center.

## Fatal Error at Workstation

If HCM detects a "logic error", it abends with message EEQ0000T and an error code. This error code is used to determine the reason of the error.

Provide the following information to the IBM Support Center.

1. Task to be accomplished
2. Name of the dialog box in error (title)
3. Sequence of events that led you to the failing dialog
4. Complete error code and the HCMERR.LOG PWS file (see "The HCMERR.LOG PWS File" on page 351)

## Communication Problems Using APPC

There are a variety of reasons why HCM might fail to setup an APPC session with the host.

Possible causes are:

- Improper definitions in the node definition file (.NDF) on the workstation
- Incorrect user id
- Incorrect password or password expired
- Host not available

You may want to follow the hints listed below:

1. Examine the message explanation
2. Make sure that
  - VTAM is started on the host
  - APPC is started on the host
  - The APPC scheduler is started
  - TP-profile defined for HCM
3. Examine the host APPC log data set "userid.Annnnnnnn.Ddddddd.Tttttt.JOBLOG" (nnnnnnnn is a decimal number). This error log will be created if the APPC

scheduler detected an error condition, for example the job defined in the TP-profile had a JCL error. The name of the APPC log data set is defined in the TP-profile.

For an example of a TP-profile, see Figure 5 on page 15.

Possible causes for the loss of communication while exchanging data with the HCD host are:

- Host termination
- HCD abend
- Network problem

See also the host APPC error log data set "userid.Annnnnnnn.Dddddd.Tttttt.JOBLOG" (nnnnnnnn is a decimal number) if you are running APPC. The data set contains information about the job that runs on the host.

The PCOMM trace or VTAM trace can also be useful for error determination.

## Communication Problems Using TCP/IP under z/OS

There are a variety of reasons why HCM might fail to setup a TCP/IP session with the host.

Possible causes can be:

- TCP/IP is not up and running
- HCM userid is not authenticated for use by UNIX System Services or does not have a home directory
- DD statement for SYSTCPD is not available
- HCM Agent job is not started as a lack of initiators
- Problem with the names server

The following suggestions may help to pinpoint the cause of the problem:

- Issue a **ping** command to check whether you have a TCP/IP connection from your workstation to the host
- Observe the console output for CBDGnnnI messages when you start the HCM dispatcher
- Try to login with HCM using a wrong userid or password: You should get an EEQX401I or EEQX402I message. In addition, you should see the CBDG985I message on the console
- When using a correct userid and password, check on the console, whether an HCM Agent job has been started, check for CBDGnnnI messages. If the HCM agent job has terminated, check its job output for possible reasons, check whether there are any EDCnnnI messages

For additional information, please refer also to the *TCP/IP Support* documentation, which can be found on the HCM home page:

<http://www.ibm.com/servers/eserver/zseries/zos/hcm>

— — — > **Product Updates**

— — — > **HCM Documentation**

## Message Problems

HCM issues messages that start with the product identifier *EEQ*. Typically, these messages warn you, or report an error condition. The messages are described in the appendix of this book.

Report any difficulties you have with an HCM message, for example:

- A message is wrong, missing or incorrectly formatted
- A message does not adequately explain the problem
- It is not clear why the message was issued

Provide the following information when reporting a message problem to the IBM Support Center:

1. Message identifier
2. Message text
3. Sequence of events leading to the message
4. Description of the problem

## **Incorrect Results**

You should report a problem when:

- HCM output is missing or contains unexpected information
- HCM fails to respond to the requested action, or incorrectly responds to the requested action without any message.
- The information/data displayed in a window is wrong or unclear

The following information is required when reporting the problem to the IBM Support Center:

1. Task to be accomplished
2. Sequence of windows (dialog boxes) used
3. Name (title) of the window in error
4. Last message displayed on the screen

The following is an attempt to give you some guidance for describing the problem:

- What operating system version are you running on (Windows 95 or higher)?
- What were the symptoms, if any?
- What are the other active programs?
- Is the problem recurring?
- What was the last sequence of events that led to the problem?
- Did these events run successfully in the past?
- If the problem is associated with a specific action, note the variables and parameters.

## **Incorrect Configuration Diagram**

If you encounter that the configuration diagram is incorrectly drawn, report the problem to the IBM Support Center and provide the following information:

- Print Screen of the failing diagram or
- Bitmap of the configuration diagram
- Sequence of events that led to the failing diagram.

## **Problems Printing Reports/Configuration Diagrams**

There are various things that can go wrong when printing a configuration diagram or context report, for example

- Wrong scaling
- Clipping
- Wrong line and fill patterns
- Wrong page breaks

The most common causes of printing problems is an incompatibility between the printer driver and the printer, or a defect in the printer driver. Make sure that the printer driver is the correct one for use with the printer you are using and that it is the latest version of the printer driver.

## Problems with Tivoli Inventory Support

Tivoli Inventory gathers information about HCM data by scanning MIF files. A conversion tool creates these files by converting HCM exported files to MIF files.

If an error occurs during the scan process, this information can be used to determine which component caused the problem.

If an error occurs during conversion, the MIF files EEQMIFxx.MIF in the target directory will be renamed to EEQMIFxx.MI~. The new extension prevents Tivoli Inventory from reading inconsistent MIF files. Tivoli Inventory will stop the processing of the distributed profile and report that some MIF files cannot be read. Take a look into the log file of the conversion tool to check the messages.

## Abnormal Termination of HCD Host

If HCD abends on the host, it makes an attempt to recover and automatically start up again. HCM displays one or more messages describing the cause of the host abend, followed by any initialization message(s).

The abend may be caused

- By detecting an logic error (most likely indicated by means of message CBDA099I)
- Broken code

You can obtain more detailed information about the HCD abend by activating the HCD trace in the *Options* menu before re-attempting the task/action that caused the host abend. The HCD trace contains diagnostic information about the abend:

- System abend code + reason code
- HCD module stack
- HCD main entry point address
- PWS and registers
- HOM history table

The following information is required when reporting an HCD host abend:

1. Sequence of events leading to the abend, such as the HCM action being performed, dialog flow, etc..
2. HCD host trace (if available)
3. HCM message, if any

## HCD Host Problems

You may be confronted with various failure causes on the host:

- Incorrect or incomplete data returned to HCD.
- Host failed to respond
- Missing or incorrect output
- Incorrect validation of the configuration change request
- Wrong HCD message

The best vehicle to determine whether or not the HCD host is working correctly, is the HCD trace. Activate the HCD trace prior to performing the action that caused

the host problem. Refer to “Using the HCD Trace Facility” on page 351 for more details on how to use the HCD trace function.

### Out of Memory Condition

If you receive one of the following HCD messages:

- CBDA056I There is not enough virtual storage available,
- CBDA474I Insufficient space to read IODF *dsname* into storage

you should consider providing more virtual storage for the HCD server on the host or enable HCD to load the IODF into a data space.

To increase the virtual storage adapt the REGION parameter for the HCD server as follows:

- If you use TCP/IP as communication protocol, you can either use an increased hardcoded value for the REGION size in the Skeleton (see “Skeleton Used to Start the HCM Agent” on page 9), or edit the EEQHCM.INI file on the workstation and specify an appropriate value for the AREGION in the section [CBDQAGNT] (see “HCM Client: Configurable Login Parameters” on page 389).
- If you use APPC as communication protocol, you can increase the REGION size in the APPC Transaction Profile (see “Step One: Define TP Profile” on page 14).

If you load the IODF into a data space, you will get storage relief in your address space. To enable HCD to load the IODF into a data space, you should specify IODF\_DATA\_SPACE=YES in your HCD profile on the host (refer to the *z/OS HCD User's Guide* ).

## Problems When Using I/O Operations Functions

If you get unexpected results when working with HCM I/O Operations functions, and some requests to I/O Operations appear to have returned misleading or incomplete data, you can use the command interface to issue a DISPLAY RESULTS command to display the result of the most recently processed command. You can also check on the console, which I/O Operations commands have been issued by HCM.

## Problems with HCM User's Guide

Report any incorrect or missing information in the HCM User's Guide, for example

- Essential information for HCM that is missing
- Any description of HCM processing that does not match the reality.
- Information is so vague that it prevents the effective use of HCM
- Conflicting information

If there is an error, ambiguity, or omission in the HCM User's Guide, determine if the situation is serious enough to affect the usage of HCM. For example, errors such as incorrect page reference or an ambiguity in a general description will not affect the usage of HCM. However, a wrong sequence in a series of steps that you have to go through can affect the HCM usage.

If the problem does not affect the usage of HCM, fill out the Reader's Comment provided at the back of the publication or write to the address shown in the edition notice. Comments help IBM improve future revisions of the publication.

If the problem has affected or can affect HCM usage, report the problem to the IBM Support Center, providing the following information:

1. Form number of publication
2. Information about the incorrect description (chapter title, page number)

## Incorrect Help Information

If you encounter problems with content, wording or mismatches, report the following to the IBM Support Center.

- Name of the help window
- Name of the last displayed dialog box
- Short description of the action being processed

### Problems with UIM-Provided Help

UIM provided help is not stored in the HCM help file (EEQHCM.HLP). This type of help will be made available to you by obtaining the help text from the host and converting it into a displayable format.

In case of an error, provide the following information to the IBM Support Center:

- Name of parameter/feature for which help was requested
- Type/model of the device for which the definition is made

---

## Installation Problems

If you have problems after starting the installation program, first check to see whether your files have been corrupted. It may be necessary to download them again in binary mode and retry the installation. If this doesn't help, obtain the current host PTF new and install it. Download the files again and retry the installation. If this still doesn't help, contact IBM.

---

## Using the HCD Trace Facility

HCD provides a trace facility that records information that can be used to locate internal HCD problems. The HCD trace records all data received by the host, passed back to the workstation, as well as the flow between the various HCD modules within the host.

You can enable the HCD trace facility from HCM. After you have logged on, you can turn the HCD trace facility on and off using the *Activate HCD Trace* menu item under *Options*. Thus you can capture trace information for only the operations that are of interest.

To turn on the HCD trace facility before logging on, select the HCD Trace checkbox in the Login dialog. You should only turn on tracing before logging on if you are interested in tracing the logon process itself. The logon process generates a large amount of trace information that you would otherwise not need. To use the HCD trace facility, you must pre-allocate a trace data set with a DD name of **HCDTRACE**.

**Note:** When the trace facility is turned on, all the trace categories will be traced until the HCD profile is read. At this point, trace parameters set in the HCD profile will influence the trace behavior. If the trace facility is turned on later, only the trace parameters set in the HCD profile will be used. See the section on Diagnostic Information and Tools in the *z/OS HCD User's Guide* for further information.

---

## The HCMERR.LOG PWS File

HCM incorporates another aid for problem determination. If a severe, unexpected, fatal error occurs, HCM saves its current execution environment in a text file called HCMERR.LOG.

This file is written by default to the same directory from which the HCM executable was launched. However, you can determine another than the default directory. This is useful if you have HCM installed in a LAN environment that has read access only. To keep the HCMERR.LOG on your local resource, you have to specify a directory in your EEQHCM.INI file. HCM uses the EEQHCM.INI file to store information and defaults across HCM sessions. It is located in the Windows system directory. Enter a line like the following into the EEQHCM.INI file in the [HCM] section:

```
ERRLOGDIR=C:\HCMLOG
```

The file is initially created by HCM when the first fatal error occurs. You can truncate or delete the file. If you do not delete the file, the data of the execution environment is appended for each fatal error.

If you want to report a problem to IBM, check whether HCM has written the file. If the file exists, supply the file to IBM.

---

## Searching Problem Reporting Data Bases and Reporting Problems

Search arguments are used to search problem reporting data bases. If the problem being diagnosed was already reported and the symptoms entered into the data base, the search will produce a match.

To perform a search, do the following:

1. Analyze the problem reporting data base and develop a search argument using the information provided in the boxes labeled *Search Argument*.
2. Complete the digits (such as ccc, nnn, hhh) according to the applicable conditions. For example, if the message EEQ0000T was received, the developed search argument for *message identifier* would be: MS/EEQ0000T. An example is shown below.

Search Argument	Description	Example
MS/ccccnns	Message identifier	MS/EEQ0000T

3. Use the search arguments to search *problem reporting data bases*. If the search finds that the problem has been reported before, request a fix from IBM.  
If the search is unsuccessful, report the problem to the IBM Support Center. Submit the information that is listed individually for the various problem areas.

For more detailed information on these steps, refer to *z/OS MVS Diagnosis: Procedures* .

---

## Reporting Problems to IBM

Before reporting a problem to IBM, search the problem-reporting data bases for the problem and possible solutions. If the problem cannot be resolved using the problem-solving database, then assemble the following information as appropriate before contacting IBM:

- Provide the data as stated in the appropriate section for the type of problem.
- Operating system type and version you are running HCM on.
- Version of HCD on the host
- Service Level of HCM

- The type of connection between the host and PWS including all software names and versions.
- The last message that HCM displayed in the status bar (bottom of window), particularly if HCM abends during IODF load/resync.
- The exact circumstances and actions that lead up to the error.
- Information about content and size of the used IODF and config files.  
In certain cases, IBM might ask you for the config file and associated IODF in order to re-create the problem.
- An HCD trace file of the problem. See “Using the HCD Trace Facility” on page 351 for more information.
- The HCMERR.LOG file, if it exists. Refer to “The HCMERR.LOG PWS File” on page 351 for details.

Be prepared to re-create the error and, if possible, to give IBM copies of your IODF and config file (.HCM).



---

## Appendix A. HCM Messages

**Note:** Messages beginning with CBD are issued by HCD. Refer to *z/OS HCD Messages* for an explanation of these messages.

---

**EEQ0000T**    **Fatal Error. Please contact IBM technical support and refer to this error code: *error-code*. Additional diagnostic information is available in the HCMERR.LOG file, if it exists.**

**Explanation:** HCM detected a logic error. The cause of the error is described in the *error-code*. The *error-code* contains the name of the module and the statement number where the logic error was detected.

**System Action:** HCM will terminate.

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ0200E**    **The PWS config file has not been saved. You may retry after rectifying the problem (for example by switching to File Manager and freeing some disk space). If you Cancel the file will not be saved.**

**Explanation:** The PWS config file has not been saved.

**System Action:** Waits for user to try again or to cancel.

**User Response:** You may retry after rectifying the problem (for example by switching to File Manager and freeing some disk space).

---

**EEQ0201E**    **Error opening PWS config file *filename* for read. Access denied. The file may be in use by another user.**

**Explanation:** The PWS config file could not be opened.

**System Action:** Aborts the file I/O operation.

**User Response:** Obtain access to the PWS config file and repeat the file I/O operation.

---

**EEQ0202E**    **Operating system error opening PWS config file *filename* for read. *OS-error-id*: *OS-error-message***

**Explanation:** Consult the documentation for your PWS operating system for the *OS-error-id* and *OS-error-message*.

**System Action:** Aborts the file I/O operation.

**User Response:** Correct the condition described by the

OS error and repeat the file I/O operation.

---

**EEQ0203E**    **Error opening PWS config file *filename* for update. Access denied. The file may be in use by another user or be write-protected.**

**Explanation:** Ensure that the config file can be opened for update.

**System Action:** Aborts the file I/O operation.

**User Response:** Obtain access to the PWS config file and repeat the file I/O operation.

---

**EEQ0204E**    **Operating system error opening PWS config file *filename* for update. *OS-error-id*: *OS-error-message***

**Explanation:** Consult the documentation for your PWS operating system for the *OS-error-id* and *OS-error-message*.

**System Action:** Aborts the file I/O operation.

**User Response:** Correct the condition described by the OS error and repeat the file I/O operation.

---

**EEQ0205T**    **Re-open of PWS config file *filename* for read failed. Access denied. The file may be in use by another user. HCM will terminate.**

**Explanation:** Ensure that the config file can be opened for read.

**System Action:** HCM terminates.

**User Response:** Obtain access to the PWS config file and repeat the file I/O operation.

---

**EEQ0206E**    **Operating system error re-opening PWS config file *filename* %d: %s HCM will Terminate.**

**Explanation:** Consult the documentation for your PWS operating system for the *OS-error-id* and *OS-error-message*.

**System Action:** Aborts the file I/O operation.

**User Response:** Correct the condition described by the OS error and repeat the file I/O operation.

---

**EEQ0207E**    **Error opening temporary PWS config file *filename*. Perhaps the disk is write protected.**

**Explanation:** HCM cannot open a temporary PWS config file.

**System Action:** Aborts the file I/O operation.

**User Response:** Ensure that temporary files can be created and written. Consult the documentation for your PWS to determine where temporary files are created.

---

**EEQ0208E**    **Error trying to backup PWS config file *filename*. The changes have been saved to temporary file *filename*..**

**Explanation:** HCM cannot backup the PWS config file.

**System Action:** Aborts the file I/O operation.

**User Response:** Ensure that the PWS config file can be created and written.

---

**EEQ0209E**    **Error trying to backup PWS config file *filename*. This file has been renamed to *filename\_2* and the changes have been saved to temporary file *filename\_3*.**

**Explanation:** HCM cannot create the PWS config file.

**System Action:** Aborts the file I/O operation.

**User Response:** Ensure that the PWS config file can be created and written.

---

**EEQ0210E**    **The changes to PWS config file *filename* have been saved, however the temporary file *filename* could not be removed.**

**Explanation:** HCM cannot delete a temporary PWS config file.

**System Action:** Completes the file I/O operation, except for deleting the named temporary file.

**User Response:** Delete the named temporary file.

---

**EEQ0211E**    **Error opening PWS config file *filename*. Perhaps the disk is write protected.**

**Explanation:** HCM cannot create the PWS config file. Occurs during a copy operation.

**System Action:** Aborts the file I/O operation.

**User Response:** Ensure that the PWS config file can be created and written.

---

**EEQ0212E**    **Operation not allowed in Standalone Mode.**

**Explanation:** Connecting and disconnecting interfaces, as well as operations which require communication with the host, are not allowed when running HCM in Standalone Mode.

**System Action:** Aborts the attempted operation.

**User Response:** Open the PWS file again when HCM is not in Standalone Mode and attempt the operation again.

---

**EEQ0213E**    **Operation not allowed for production PWS files.**

**Explanation:** Certain operations, such as editing, are forbidden when the currently open PWS file is a production file.

**System Action:** Aborts the attempted operation.

**User Response:** Convert the file to a work file using the File | Make Work... menu choice and perform the operation on the work file.

---

**EEQ0214E**    **This configuration is open in Read-Only mode. Updates are not allowed.**

**Explanation:** When the PWS file was opened, it was opened with read-only access. This is either because you selected read-only access from a re-synchronization or upgrade confirmation dialog, or because the configuration contains advanced features saved by a later release of HCM, which this release would not be able to maintain if editing were permitted.

**System Action:** Aborts the attempted operation.

**User Response:** Determine the reason for the read-only access. Closing, then opening the PWS file again should cause a dialog to be displayed which will indicate the reason. If the reason was that you had chosen read-only access from a confirmation dialog, you may choose read-write access instead. If the reason was that the configuration contains advanced features, you have two options:

1. Remove the advanced features from the IODF and re-synchronize the PWS file to the IODF. It will then be editable.
2. Upgrade to a newer release of HCM.

---

**EEQ0215E**    **Necessary PWS file upgrading could not be completed.**

**Explanation:** PWS files saved with an earlier version of HCM sometimes require upgrading (information conversion and supplementation) when opened with a later version. The above message means the upgrading could not be completed (often because host communication or actions failed, or write access to the PWS file could not be gained). This message usually occurs in conjunction with another message which

more specifically states the reason for the failure.

**System Action:** HCM aborts the attempt to open the PWS file and waits for next user menu selection.

**User Response:** Alleviate the cause of the failure and try opening the PWS file again.

---

**EEQ0250E** File *filename* line *line-number*: **Import terminated.** Variable text.

**Explanation:** The import operation can not continue due to one or more severe errors.

**System Action:** HCM aborts the import operation and returns to the main diagram with an empty configuration (no file open).

**User Response:** Alleviate the cause of the failure and try importing the file again.

---

**EEQ0251E** File *filename* line *line-number*: **Record not processed.** Variable text.

**Explanation:** The record data is ignored due to one or more errors.

**System Action:** HCM asks you if you want to keep the imported changes.

**User Response:** Respond with "no" to return to the main menu, respond with "yes" to proceed with the IODF update dialogs.

---

**EEQ0252E** File *filename* line *line-number*: *field-description* **not processed.** Variable text.

**Explanation:** Aside from the field, the record data was used.

**System Action:** HCM asks you if you want to keep the imported changes.

**User Response:** Respond with "no" to return to the main menu, respond with "yes" to proceed with the IODF update dialogs.

---

**EEQ0253I** File *filename* line *line-number*: Variable text.

**Explanation:** Indicates side effects that can occur while processing an import record, for example, the implicit disconnect that occurs when two otherwise connected interfaces are connected with each other.

**System Action:** Processing proceeds with the IODF Update dialog.

**User Response:** No action.

---

**EEQ0260E** Variable text.

**Explanation:** The export operation can not continue due to one or more severe errors.

**System Action:** HCM aborts the export operation and returns to the main diagram.

**User Response:** Alleviate the cause of the failure and try exporting the file again.

---

**EEQ0261E** Variable text.

**Explanation:** The record data is ignored due to one or more errors.

**System Action:** No action

**User Response:** No action

---

**EEQ0262E** Variable text.

**Explanation:** Aside from the field, the record data was used.

**System Action:** No action

**User Response:** No action

---

**EEQ0263I** Variable text.

**Explanation:** Indicates side effects that can occur while processing an export record.

**System Action:** Processing proceeds.

**User Response:** No action.

---

**EEQ0400E** Error opening controller physical description file: *filename*

**Explanation:** HCM cannot open a PDF file.

**System Action:** Waits for user to either cancel or continue, in which case the PDF is ignored.

**User Response:** Ensure that HCM can open the PDF files in the controller PDF directories.

---

**EEQ0401E** Error opening string physical description file: *filename*

**Explanation:** Ensure that HCM can open the PDF files in the string PDF directories.

**System Action:** Waits for user to either cancel or continue, in which case the PDF is ignored.

**User Response:** Ensure that HCM can open the PDF files in the controller PDF directories.

---

**EEQ0402E**    **Physical description file *filename* cannot be loaded.** *specific syntax error and line number.* **The rest of this PDF will be ignored. Do you wish to continue?**

**Explanation:** A syntax error has been found in a controller PDF.

**System Action:** Waits for user to either cancel or continue, in which the PDF is ignored.

**User Response:** Correct the error in the PDF file. Consult the syntax grammar for controller PDFs under “Controller PDF Syntax” on page 340.

---

**EEQ0403E**    **Physical description file *filename* cannot be loaded...** *specific syntax error and line number.* **This may cause problems when creating strings. Do you wish to continue?**

**Explanation:** A syntax error has been found in a string PDF.

**System Action:** Waits for user to either cancel or continue, in which case the PDF is ignored.

**User Response:** Correct the error in the PDF file. Consult the syntax grammar for string PDFs under “String PDF Syntax” on page 342.

---

**EEQ0404E**    **Subsystem type *typename* has already been updated**

**Explanation:** A second definition for this subsystem type was found in a controller PDF.

**System Action:** Waits for user to either cancel or continue. If the user cancels then the file I/O operation is aborted. If the user continues, the second PDF is ignored.

**User Response:** Either cancel and fix the problem or continue.

---

**EEQ0405E**    **Subsystem type *typename* has already been defined in a previous PDF.**

**Explanation:** A second definition for this string type was found in string PDF.

**System Action:** Waits for user to either cancel or continue. If the user cancels, then the file I/O operation is aborted. If the user continues, the second PDF is ignored.

**User Response:** Either cancel and fix the problem or continue.

---

**EEQ0410W**    **Could not open file *apd-file-name*.**

**Explanation:** The APD file could not be opened.

**System Action:** HCM offers you the choice of proceeding with the IODF load or re-synchronization despite the fact that the APD file could not be opened, or returning to the *Choose Physical Description Assignment File* dialog.

**User Response:** You may choose to continue the load or re-synchronization or return to the dialog for choosing an APD file. Possible reasons that the file could not be opened are:

- incorrect file or directory specification
- lack of read access to the device, directory, or file
- file sharing conflicts.

It is often possible to remedy such problems by switching tasks, using a utility that allows file system manipulation, and then returning to the HCM task to choose the same or another APD file.

---

**EEQ0411W**    **Line *line-number*: Control unit *cu-id* does not exist in the IODF.**

**Explanation:** In the APD file, a control unit id was encountered which does not exist in the IODF that HCM is using in the current load or re-synchronization operation.

**System Action:** HCM offers you the choice of proceeding with the IODF load or re-synchronization despite the fact that there were problems with the APD file, or returning to the *Choose Physical Description Assignment File* dialog.

**User Response:** You may continue with the IODF load or re-synchronization despite the errors or discrepancies in the APD file, or you may go back to the *Choose Physical Description Assignment File* dialog and choose another APD file. You may wish to use task switching to edit and correct the APD file before choosing the same APD file again.

---

**EEQ0412W**    **Line *line-number*: device *dev-id* does not exist in the IODF.**

**Explanation:** In the APD file, a device string id was encountered which does not exist in the IODF that HCM is using in the current load or re-synchronization operation.

**System Action:** HCM offers you the choice of proceeding with the IODF load or re-synchronization despite the fact that there were problems with the APD file, or returning to the *Choose Physical Description Assignment File* dialog.

**User Response:** You may continue with the IODF load or re-synchronization despite the errors or discrepancies in the APD file, or you may go back to the *Choose Physical Description Assignment File* dialog and choose another APD file. You may wish to use task

switching to edit and correct the APD file before choosing the same APD file again.

---

**EEQ0413W**    **Line line-number: Controller physical description descrip-name not found.**

**Explanation:** A physical description name for a controller was specified in the APD file, but that name was not found in the physical description files (PDFs) available to HCM.

**System Action:** HCM offers you the choice of proceeding with the IODF load or re-synchronization despite the fact that there were problems with the APD file, or returning to the *Choose Physical Description Assignment File* dialog.

**User Response:** You may continue with the IODF load or re-synchronization despite the errors or discrepancies in the APD file, or you may go back to the *Choose Physical Description Assignment File* dialog and choose another APD file. You may wish to use task switching to edit and correct the APD file before choosing the same APD file again.

---

**EEQ0414W**    **Line line-number: String physical description descrip-name not found.**

**Explanation:** A physical description name for a device string was specified in the APD file, but that name was not found in the physical description files (PDFs) available to HCM.

**System Action:** HCM offers you the choice of proceeding with the IODF load or re-synchronization despite the fact that there were problems with the APD file, or returning to the *Choose Physical Description Assignment File* dialog.

**User Response:** You may continue with the IODF load or re-synchronization despite the errors or discrepancies in the APD file, or you may go back to the *Choose Physical Description Assignment File* dialog and choose another APD file. You may wish to use task switching to edit and correct the APD file before choosing the same APD file again.

---

**EEQ0415W**    **Line line-number: Invalid syntax: text-from-APD-file.**

**Explanation:** The APD file contained text which could not be parsed because it did not conform to APD file syntactic requirements.

**System Action:** HCM offers you the choice of proceeding with the IODF load or re-synchronization despite the fact that there were problems with the APD file, or returning to the *Choose Physical Description Assignment File* dialog.

**User Response:** You may continue with the IODF load or re-synchronization despite the errors or discrepancies in the APD file, or you may go back to the *Choose Physical Description Assignment File* dialog

and choose another APD file. You may wish to use task switching to edit and correct the APD file before choosing the same APD file again.

---

**EEQ0416W**    **Line line-number: Too many errors were encountered - the rest of this file will be ignored.**

**Explanation:** Too many errors were found in the APD file to continue to parse it, which may indicate that the file was not a proper APD file at all.

**System Action:** HCM offers you the choice of proceeding with the IODF load or re-synchronization despite the fact that there were problems with the APD file, or returning to the *Choose Physical Description Assignment File* dialog.

**User Response:** You may continue with the IODF load or re-synchronization despite the errors or discrepancies in the APD file, or you may go back to the *Choose Physical Description Assignment File* dialog and choose another APD file. You may wish to use task switching to edit and correct the APD file before choosing the same APD file again.

---

**EEQ0600E**    **Logon (HCD session establishment) error has occurred.**

**Explanation:** This message is preceded by another message which tells why the logon attempt failed.

**System Action:** HCM terminates.

**User Response:** Remedy the situation that caused the logon attempt to fail (e.g. wait for the host system to become available).

---

**EEQ0601E**    **Illegally formatted prompt information returned by HCD host.**

**Explanation:** HCM has sent a *prompt* request to the HCD host, but the returned data are either incomplete, unrecognized or wrong. One possible reason is an HCD abend on the host or the loss of the communication link between HCM and HCD.

**System Action:** HCM terminates

**User Response:** See Chapter 18, "Problem Determination" on page 345 for diagnostic instructions.

---

**EEQ0602E**    **HCD on host has responded with wrong language (not English).**

**Explanation:** HCD is not correctly configured.

**Explanation:** An attempt has been made to establish a session with HCD on the host, but the English language part is not installed on the host.

**System Action:** HCM terminates

**User Response:** Make sure that the English FMID is installed, otherwise see Chapter 18, "Problem

Determination” on page 345 for diagnostic instructions.

---

**EEQ0603E HCD on host is running under wrong operating system.**

**Explanation:** An attempt has been made to establish a session with HCD on the host, but HCD does not run under MVS/ESA. This, however, is not possible.

**System Action:** HCM terminates

**User Response:** See Chapter 18, “Problem Determination” on page 345 for diagnostic instructions.

---

**EEQ0604E An incompatible level of HCD is running on the host.**

**Explanation:** Ask your system programmer to upgrade HCD. For more information see the EEQREAD.ME file of HCM. Internal description code: Cw-x Ry-z.

**System Action:** HCM terminates.

**User Response:** Do not retry the action unless and until a newer release of HCD is installed on the host. The internal description code allows IBM Support to determine the required release of HCD.

---

**EEQ0605W The release of the HCD interface available on the host is not up to date with this release of HCM.**

**Explanation:** You may proceed, but some functionality may not be available.

**System Action:** None.

**User Response:** Proceed but expect some requested actions to fail with error.

---

**EEQ0606E *feature-description* not supported by the HCD interface for the release of HCD in use.**

**Explanation:** Ask your system programmer to upgrade HCD if applicable. For more information see the EEQREAD.ME file of HCM. Internal description code: Cw-x Ry-z.

**System Action:** HCM cancels the current action.

**User Response:** Do not retry the action unless and until a newer release or service of HCD is installed on the host. The internal description code allows IBM Support to determine the required release of HCD.

---

**EEQ0607E Attempt to load library EEQRHOMW.DLL failed. (You may still choose to run in Standalone Mode).**

**Explanation:** An attempt has been made to establish a host connection, but the library file EEQRHOMW.DLL cannot be loaded.

**System Action:** HCM displays the logon panel to allow another logon attempt.

**User Response:** Remedy the situation that caused the logon attempt to fail or choose to press the Standalone button if logging in is not possible or not desired.

---

**EEQ0608E GetProcAddress failed on EEQRHOMW.DLL. Your version of EEQRHOMW.DLL may be outdated or corrupt. (Replace EEQRHOMW.DLL or remove it and run in Standalone Mode).**

**Explanation:** An attempt has been made to establish a host connection, using an outdated or corrupt version of the library file EEQRHOMW.DLL

**System Action:** HCM displays the logon panel to allow another logon attempt.

**User Response:** Remedy the situation that caused the logon attempt to fail or choose to press the Standalone button if logging in is not possible or not desired.

---

**EEQ0609W The version of HCD on the host does not fully support switches with multiple internal control units (present in this IODF). Some switch related operations may be refused by HCD.**

**Explanation:** See message text.

**System Action:** None.

**User Response:** Do not retry the action unless and until a newer release of HCD is installed on the host.

---

**EEQ0991T Invalid HOM storage descriptor. The program will terminate.**

**Explanation:** While retrieving data from HCD, HCM received an unrecognized record.

**System Action:** HCM terminates.

**User Response:** Report this problem to IBM. See “Reporting Problems to IBM” on page 352 on how to do that.

---

**EEQ0992T No data conversion defined for this storage descriptor. The program will terminate.**

**Explanation:** The HCM ASCII/EBCDIC conversion routine received a record, but does not know how to convert the record. Most likely, a wrong record was received from HCD or passed for transmission to the host.

**System Action:** HCM terminates

**User Response:** Report this problem to IBM. See “Reporting Problems to IBM” on page 352 on how to do that.

---

**EEQ0993T**    **Corrupted HOM interface record. The program will terminate.**

**Explanation:** A corrupted record was received from HCD.

**System Action:** HCM terminates

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ0994T**    **A severe error has occurred on the host.**

**Explanation:** HCD is not active on host. Program will terminate.

**System Action:** HCM terminates.

**User Response:** Run HCM again, this time selecting the checkbox for the TRACE option in the login dialog. Supply the resulting HCD.TRACE dataset on the host to the IBM service center. Further clues to the cause of the severe error may be gained by running HCD manually on the host. If HCD experiences a similar severe error when run manually, it may be due to the same cause. There may be relevant messages left in the HCD.MSGLOG data set after a manual HCD session has terminated.

---

**EEQ1000E**    **RHOM\_E\_NO\_CONVERSATION - internal error. RHOM interface violation: Bad conversation handle.**

**Explanation:** HCM passed an invalid conversation handle to RHOM during an HCD access call.

**System Action:** HCM terminates.

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ1001E**    **RHOM\_E\_ALLOC - Insufficient memory (component RHOM)**

**Explanation:** RHOM was unable to allocate memory (usually during host logon).

**System Action:** HCM terminates.

**User Response:** Try closing other Windows applications to free memory.

---

**EEQ1002E**    **RHOM\_E\_NO\_IBUF - Internal error. RHOM interface violation: Input buffer must not be NULL.**

**Explanation:** The RHOM interface was violated by HCM by not passing a valid input buffer for HCD access.

**System Action:** HCM terminates.

**User Response:** Report this problem to IBM. See

"Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ1003E**    **RHOM\_E\_NO\_OBUF - Internal error. RHOM interface violation: Output buffer must not be NULL**

**Explanation:** The RHOM interface was violated by HCM by not passing a valid output buffer for HCD access.

**System Action:** HCM terminates.

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ1100E**    **RFHOM\_E\_BAD\_REQUEST\_CODE - Internal error. RFHOM interface violation: Unknown request.**

**Explanation:** HCM/HCD interface routine received an invalid request code from the workstation. The reason is either a garbled network transmission or an HCM/HCD interface routine interface violation by component RHOM.

**System Action:** HCM terminates.

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ1101E**    **RFHOM\_E\_OPENLOG - Error opening HCD server host logfile**

**Explanation:** HCM/HCD interface routine received a request with the host logfile flag set. The attempt to open the logfile failed. The default logfile dataset name on the host is HLQ.CBDQRHOM.LOG (where HLQ is the user's TSO session qualifier).

**System Action:** HCM terminates.

**User Response:** Verify that sufficient disk space on the host is available.

---

**EEQ1102E**    **RFHOM\_E\_CLOSELOG - Error closing HCD server host logfile**

**Explanation:** HCM/HCD interface routine was unable to close the host logfile dataset. The default logfile dataset name on the host is HLQ.CBDQRHOM.LOG (where HLQ is the user's TSO session qualifier).

**System Action:** HCM terminates.

**User Response:** Verify that sufficient disk space on the host is available.

---

**EEQ1103E RFHOM\_E\_LOADHOM - Error loading HOM. Please verify that HCD host access is correctly configured. Check STEPLIB in APPC TP profile.**

**Explanation:** HCM/HCD interface routine could not load the HCD HOM interface component (CBDMGHOM).

**System Action:** HCM terminates.

**User Response:** Verify that HCD is correctly installed on the MVS host. Verify that the STEPLIB specification of your APPC TP profile includes the HCD load libraries.

---

**EEQ1104E RFHOM\_E\_DUMPHRB - Internal error (component RFHOM). Error during DumpHRB**

**Explanation:** HCM/HCD interface routine encountered an error in the DumpHRB routine.

**System Action:** HCM terminates.

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ1105E RFHOM\_E\_DUMPIOBUF - Internal error (component RFHOM). Error during DumpIOBuf**

**Explanation:** HCM/HCD interface routine encountered an error in the DumpIOBuf routine.

**System Action:** HCM terminates.

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352 on how to do that.

---

**EEQ5000I Conversion routine started.**

**Explanation:** This message is shown when the routine started working. The input parameters are shown as they were stated.

---

**EEQ5001I Conversion routine ended.**

**Explanation:** This message is shown when the routine ended working and no error occurred that forced an abnormal or error end.

---

**EEQ5003E Files found: [Path+filename]**

**Explanation:** Shows a list of identified filenames including path which will be processed.

---

**EEQ5004E No file found in directory [Directory]**

**Explanation:** No files were found in the directory.

**System Action:** The conversion tool stops. No conversion took place.

**User Response:** Make sure that you did not specify an empty source directory.

---

**EEQ5005E No file found matching: '[File]'.**

**Explanation:** No file was found matching the name [File].

**System Action:** The conversion tool stops. No conversion took place.

**User Response:** Make sure you specified an existing source file.

---

**EEQ5006I Started processing of file: '[Path+filename]'**

**Explanation:** The mentioned file is being processed.

---

**EEQ5007I Ended processing of file: '[Path+filename]'. All [X] data-records correctly processed.**

**Explanation:** The mentioned file has been processed. There were all [X] data records correctly identified.

---

**EEQ5008E Aborted processing file: '[Path+filename]'.**

**Explanation:** The processing of the mentioned file was aborted due to the occurrence of an error.

**System Action:** Processing of the specified file stops. Conversion process continues.

**User Response:** Make sure, you specified only HCM exported files.

---

**EEQ5010E Unable to open file: '[Path+filename]'.**

**Explanation:** There was an error while opening a file.

**System Action:** Conversion process stops.

**User Response:** Make sure, the user running the conversion tool has sufficient access authority to perform the action.

---

**EEQ5011E Unable to access directory: '[Directory]'.**

**Explanation:** There was an error while trying to access a directory.

**System Action:** Conversion process stops.

**User Response:** Make sure, the user running the conversion tool has sufficient access authority to perform the action.

---

**EEQ5012E    Unable to create file: '[Path+filename]'.**

**Explanation:** There was an error while creating a file.

**System Action:** Conversion process stops.

**User Response:** Make sure, the user running the conversion tool has sufficient access authority to perform the action.

---

**EEQ5013E    Unable to create directory: '[Directory]'.**

**Explanation:** There was an error while trying to create a directory.

**System Action:** Conversion process stops.

**User Response:** Make sure, the user running the conversion tool has sufficient access authority to perform the action.

---

**EEQ5014E    Unable to write to file:  
              '[Path+filename]'.**

**Explanation:** There was an error while trying to write to a file.

**System Action:** Conversion process stops.

**User Response:** Make sure, the user running the conversion tool has sufficient access authority to perform the action.

---

**EEQ5015E    Invalid syntax.**

**Explanation:** The conversion tool was invoked with a syntax error.

**System Action:** Conversion process stops. No conversion took place.

**User Response:** Make sure the conversion tool was syntactical correctly invoked.

---

**EEQ5016E    No such logical drive: '[Drive]'.**

**Explanation:** The source or target parameter referred to a nonexistent logical drive.

**System Action:** Conversion process stops. No conversion took place.

**User Response:** Make sure the specified source or target directory contains a valid logical drive letter.

---

**EEQ5017E    Could not find [Directory].**

**Explanation:** Unable to find a directory.

**System Action:** Conversion process stops. No conversion took place.

**User Response:** Make sure the specified source directory exists.

---

**EEQ5018E    Is not a directory: '[String]'**

**Explanation:** The specified target is not a directory.

**System Action:** Conversion process stops. No conversion took place.

**User Response:** Make sure a directory was specified when using the -t option.

---

**EEQ5019E    Unable to allocate required memory.**

**Explanation:** The process could not get sufficient memory from the run time system.

**System Action:** Dependent on the severity of the error the conversion process may either stop or continue.

**User Response:** Make sure that enough virtual memory is available from the runtime system.

---

**EEQ5021E    Internal error.**

**Explanation:** An error occurred due to the inner structure of the conversion tool.

**System Action:** Conversion process stops.

**User Response:** Report this problem to IBM. See "Reporting Problems to IBM" on page 352.

---

**EEQ5022I    MIF files may be corrupted.**

**Explanation:** Due to an error during the conversion process, the integrity of the produced MIF files is not granted.

**User Response:** Check log file for error or warning messages, remove their cause, remove produced MIF files and run the Inventory scan and/or conversion process again.

---

**EEQ5023E    Error while reading from file :'[File]'.**

**Explanation:** An error occurred while reading from file [File]. The processing of this file will be aborted.

**System Action:** Conversion process stops.

**User Response:** Check the specified file and associated file system for integrity.

---

**EEQ5024E    Unable to get required system  
              information.**

**Explanation:** The conversion tool could not get required information from the runtime system.

**System Action:** Conversion process stops.

**User Response:** Check setting and integrity of the operating system.

---

**EEQ5025E    Unable to get file handle.**

**Explanation:** The conversion tool could not get a file handle to search for specific files.

**System Action:** Conversion process stops.

**User Response:** Check uses file system and access authorities.

---

**EEQ5026W    At least one error or warning message occurred during conversion.**

**Explanation:** At least one error or warning message came up during the conversion process. For details see screen output or log file (if such one is produced).

**User Response:** Examine log file for error and/or warning messages and remove their cause. If necessary, remove already produced MIF files and run the Inventory scan and/or conversion tool again.

---

**EEQ5027I    Renaming produced or obsolete MIF files.**

**Explanation:** A set produced or obsolete (e.g. remaining from the previous conversion process) is being renamed to 'EEQMIFXX.MI~'.

---

**EEQ5028E    Failed to rename file '[File1]' to '[File2]'.**

**Explanation:** The renaming of file [File1] to [File2] failed.

**User Response:** Make sure the user who runs the conversion tool has sufficient access authority to rename the specified file.

---

**EEQ5029W    Set of MIF files in '[Directory]' may not reflect a valid HCM exported configuration.**

**Explanation:** The renaming of MIF files failed in directory [Directory] for at least one file. The reflected configuration by the remaining MIF files may not be valid.

**User Response:** Remove or rename produced MIF files. The set of produced MIF files may contain an invalid HCM exported configuration.

---

**EEQ5030E    Could not process header. File cannot be processed.**

**Explanation:** An error occurred during the processing of the header-record.

**System Action:** Dependent on the severity of the error the conversion process may either stop or continue.

**User Response:** Remove cause of the error from specified file. Make sure a valid set of HCM exported files was chosen for conversion. Make sure the HCM exported files were not changed manually.

---

**EEQ5031W    Unknown column name. Column will be ignored.**

**Explanation:** A unknown column-name [Name of column] was found in the header-record. This column will be ignored.

**System Action:** Conversion process continues. The referred column will be ignored.

**User Response:** Make sure that corresponding versions of HCM and conversion tool are used.

---

**EEQ5032E    Could not process data. Current line will not be processed.**

**Explanation:** The current data-record could not be read due to occurrence of an error.

**System Action:** Conversion process stops.

**User Response:** Remove cause of the error from specified file. Make sure a valid set of HCM exported files was chosen for conversion. Make sure the HCM exported files were not changed manually.

---

**EEQ5050W    Not all diagnostic messages were written to the log file. Use the 'xlog' option to get every diagnostic message.**

**Explanation:** There occurred more than 10 diagnostic messages and the 'log' option was given (default).

**User Response:** Specify the option '-xlog' to get every diagnostic message written into the log file.

---

**EEQ5051W    Full component name of file '[File]' too long, or current directory path too long, or source directory path too long.**

**Explanation:** Either the fully qualified component name of file [file], or the fully qualified name of the current directory, or the fully qualified name of the source directory is too long to be displayed.

**System Action:** Conversion tool stops. No conversion took place.

**User Response:** Shorten the fully qualified name of the specified file or directory.

---

**EEQ5052E    Maximum number of columns or data fields exceeded.**

**Explanation:** There were too much columns or data fields encountered in one row.

**System Action:** Conversion process stops.

**User Response:** Make sure that a valid set of HCM exported files was chosen for the conversion. Make sure the HCM exported files were not changed manually.

---

**EEQ5053E Maximum length of [X] exceeded.**

**Explanation:** The maximum possible length of [X] was exceeded. where [X] = 'name of table', [X] = 'data field', or [X] = 'name of column'.

**System Action:** Conversion process stops.

**User Response:** Make sure that a valid set of HCM exported files was chosen for the conversion. Make sure the HCM exported files were not changed manually.

---

**EEQC401E Host communication error**

**Explanation:** Invalid or mistyped or expired userid or password.

---

**EEQC404E Host communication error**

**Explanation:** Most likely, a wrong (outdated) TP profile has been specified in the CPI-C side information.

---

**EEQC406E Host communication error**

**Explanation:** Possible reason: APPC local node not started.

---

**EEQC408E Host communication error**

**Explanation:** A session cannot be established for User ID user\_id, symbolic destination sdn, and domain (local).

---

**EEQC410E Host communication error**

**Explanation:** Possible reason: HCM client configuration error: name of HCM APPC host transaction program incorrectly specified, please check your CPI-C side information entry for the selected host.

---

**EEQX100E Host communication error.**

**Explanation:** The HCM dispatcher on host <name> may be busy or not listening on port <port#>.

**System Action:** No connection to host.

**User Response:** Start the dispatcher and check you have specified the correct port number.

This message can also occur, if the HCM dispatcher has been started at a time, when TCP/IP was not already active. Stop the HCM dispatcher, start TCP/IP, and start the HCM dispatcher again. If TCP/IP is already started, stop the dispatcher and start it again.

---

**EEQX102E Host communication error.**

**Explanation:** The hostname <name> is unknown.

**System Action:** No connection to host.

**User Response:** Verify that you spelled the hostname correctly. If the spelling is correct, use the **ping** command to check the host connection.

---

**EEQX305E Host communication error.**

**Explanation:** Timeout waiting for HCM dispatcher reply.

**System Action:** No connection to host.

**User Response:** Increase <eeqhcm.ini[CBDQTDIS]rtimeout>. Verify that you spelled the hostname correctly.

---

**EEQX401E Host communication error.**

**Explanation:** Security validation failed.

**System Action:** No connection to host.

**User Response:** Check the spelling of your HCM user id.

---

**EEQX402E Host communication error.**

**Explanation:** Security validation failed.

**System Action:** No connection to host.

**User Response:** Check that your password is valid.

---

**EEQX405E Host communication error.**

**Explanation:** No available server port found for new HCM agent.

**System Action:** No connection to host.

**User Response:** Widen <eeqhcm.ini[CBDQAGNT]portmin..portmax>.

---

**EEQX406E Host communication error.**

**Explanation:** The HCM dispatcher does not have read access to the skeleton, which is used to setup the JCL for starting the HCM agent. Or, the HCM dispatcher could not find the data set for the skeleton, which is to be used to start the HCM agent; it might not exist.

**System Action:** No connection to host.

**User Response:** Please check the data set to be used as skeleton. It should be one of:

- Default data set name (SYS1.PROCLIB(CBDQAJSK))
- Data set specified in the procedure or JCL, which has been used to start the HCM dispatcher
- Data set specified in the HCM user's ini file in the section [CBDQAGNT] with the keyword AJCLSKEL.

---

**EEQX407E Host communication error.**

**Explanation:** The HCM dispatcher could not write the HCM agent JCL file.

**System Action:** No connection to host.

**User Response:** Specify  
[CBDQAGNT]ajclofn=<writable dataset>.

---

**EEQX410E Host communication error.**

**Explanation:** The HCM dispatcher could not verify a successful start of a new HCM agent.

**System Action:** No connection to host.

**User Response:** Check agent job log / agent trace on host for startup errors.

---

**EEQX414E Host communication error.**

**Explanation:** The HCM dispatcher timed out waiting for a new HCM agent.

**System Action:** No connection to host.

**User Response:** Increasing  
<eeqhcm.ini[CBDQTDIS]atimeout> Also: check agent job log / agent trace on host for startup errors.

---

**EEQX415E Host communication error.**

**Explanation:** The HCM dispatcher cannot do security validations.

**System Action:** No connection to host.

**User Response:** Verify that the dispatcher is running as an APF authorized program.

---

**EEQX416E Host communication error.**

**Explanation:** The HCM dispatcher received an invalid request package.

**System Action:** No connection to host.

**User Response:** The HCM client request may have been corrupted during transfer, please retry.

---

**EEQX500E Host communication error.**

**Explanation:** I/O exception waiting for HCM dispatcher reply.

**System Action:** No connection to host.

**User Response:** The connection to the HCM dispatcher was interrupted, verify that the dispatcher is still running.

---

---

**EEQX501 Host communication error.**

**Explanation:** Exception receiving HCM agent reply.

**System Action:** No connection to host.

**User Response:** Check if the HCM client-agent connection is lost.

---

**EEQX502E Host communication error.**

**Explanation:** Timeout waiting for HCM agent's reply to client logon request.

**System Action:** No connection to host.

**User Response:** Increase  
<eeqhcm.ini[CBDQAGNT]rtimeout>.

---

**EEQX503E Host communication error.**

**Explanation:** Timeout waiting for HCM agent reply.

**System Action:** No connection to host.

**User Response:** Check that the HCM agent is still running. Increase <eeqhcm.ini[CBDQAGNT]rtimeout>.

---

---

## Appendix B. Alternate Processor Definitions

The physical *machine* may have multiple logical processors known as *shadows*. The *primary processor* in the processor complex is that which is in the current logical view; at IODF load/resync time, processor complex connections are built for primary processors only. *Alternate* or *shadow processors* are those not in the current view; no physical connections are built for alternate processors at IODF load/resync time. Every processor must be assigned to a new or existing processor complex. The name of the processor complex is the name of the primary processor.

You can:

- Create or delete shadow processors during an HCM session
- Confirm or change which processors are assigned to which machine during an IODF load or resync process.

---

### Managing Shadow Processors During an HCM Session

Display the Processors dialog by choosing the **Manage Shadow Processors...** command in the **Edit** menu. A list of logical processors, sorted by processor within processor complex, appears. You can create or delete shadow processors, change the processor style, or make a processor primary or alternate.

#### Creating a New Processor Under a Machine

You can create a new processor by selecting the machine from the **Processors** dialog and pressing the **New...** button. The **Create Processor** dialog appears to allow you to create an alternate processor under the selected machine.

#### Deleting a Processor from a Machine

You can delete a processor, provided it is not the only one within the machine. Select a processor from the **Processors** dialog and press **Delete**. HCM will display a confirmation dialog before deleting the processor. Primary and alternate status settings are adjusted as required for the remaining processors in the machine.

#### Changing the Processor Style

Select a processor from the **Processors** dialog and press the **Change Style...** button. The **Change Machine Style** dialog appears, giving you the choice of an IBM style (default) or a “one processor per partition” style machine. The button is enabled if the machine contains only new processors. The button is disabled if any of the new processors involved contain partitions.

#### Making a Processor Primary or Alternate

Select a processor from the **Processors** dialog and press **Primary**. For IBM style processors, the selected processor becomes the primary one. The **Primary** button is enabled only if the machine has more than one processor; it is disabled if the selected processor is already the primary one. Unselected processors within the machine become alternates.

For “one processor per partition” style processors, the button is enabled only if there is more than one processor; it is disabled if the selected processor is the only

primary processor. Otherwise, the primary/alternate state of the selected processor is toggled. Note that this style of processor may have more than one primary processor.

---

## Assigning Processors to Machines During IODF Load/Resync

During an IODF load or resync, the **Machines** dialog will automatically appear when there are new processors (added to the IODF on the host) which must be assigned to new or existing machines, or any time that some machine has more than one processor.

If HCM discovers that the IODF being loaded contains new processors, it will attempt to assign each processor to a machine by matching first serial numbers, then SNA addresses. If unsuccessful, HCM will tentatively assign the new processor to a new machine. When the **Machine** dialog automatically appears, it will ask you to confirm or change HCM's assignments before continuing the load/resync process.

If you create a new machine to which to re-assign the new processor (by selecting the processor and pressing **New...** in the **Machine** dialog), it becomes the primary processor. If you re-assign the new processor to a different, existing machine (using the **Assign...** button to display the **Assign Machine** dialog), it becomes an alternate processor. If re-assigning the processor leaves the old machine without processors, it is deleted. Otherwise, primary and alternate settings are adjusted as necessary.

You can change a machine's style, or make it a primary or alternate processor. See "Managing Shadow Processors During an HCM Session" on page 367.

At this point, HCM identifies new processors and labels them as 'new'. HCM also identifies deleted processors and labels them as 'deleted'.

---

## Appendix C. “One Processor Per Partition” Machines

An alternative to IBM’s processor partitioning scheme is one in which, instead of each partition being represented by an LPAR object in the IODF, each partition is represented by its own processor. HCM calls this scheme “one processor per partition” (“OPPP” in this chapter) and provides the following support for it.

1. IODF load and resync
2. Creating and deleting
3. Editing
4. CHPID mapping
5. Connecting
6. CTC connections

HCM represents OPPP machines similarly to the way it represents machines with multiple logical (alternate or shadow) processors. More than one processor object in the IODF can be mapped to an HCM machine. For machines with multiple logical processors, exactly one processor is designated the “primary” processor and can be edited or have connections made to it in HCM. For OPPP machines, more than one processor can be designated “primary”, thus allowing you to edit and make connections to several “partitions” with HCM.

---

### IODF Load and Resync

When HCM encounters new OPPP processors during IODF load or resync it maps them to existing or new machines or to its own machine by matching its serial number or SNA address. When the **Processors** dialog is opened the new processors are listed with status “NEW”.

To assign an OPPP processor to another machine, select it and click **Assign**.

To change the style of a machine to OPPP, select it and click **Change Style**.

To toggle an OPPP processor between *Primary* and *Alternate*, select it and click **Primary** or **Alternate**. In OPPP machines, there can be more than one primary processor.

When the new processors have been assigned properly and the machines styles are correct, click **OK** to complete the load or resync processes.

### Creating and Deleting “One Processor Per Partition” Processors

To create a new OPPP machine, add a processor to an OPPP machine, or delete a processor from an OPPP machine, select the **Edit:Manage Shadow Processors** menu item.

To create a new OPPP machine, select the **Create:Processor** menu item and fill in the **Create Processor** dialog. Now select **Edit:Manage Shadow Processors**, select the new processor and click **Change Style**.

To add a new processor (partition) to an OPPP machine, select the machine in the **Shadow Processors** dialog and click **Create**. Fill in the **Create Processor** dialog to create the new processor.

To delete a processor (partition) from an OPPP machine, select the machine in the **Shadow Processors** dialog and click **Delete**.

## Editing “One Processor Per Partition” Processors

To edit an OPPP processor, select the **Edit:Processor** menu item and double-click on the processor. Note the label of an OPPP machine is the same as the label of its first processor.

In the **Processor** dialog, choose the particular processor (partition) from the **Label** combo-box. Now you can edit that particular processor as you would any other processor.

## CHPIDs, Channels, and CHPID Mapping

The distinction between CHPIDs in the IODF and channels in HCM becomes very important for OPPP machines. Each IODF processor has its own set of CHPIDs. However, the OPPP *machine* has only one set of physical *channels*.

Usually each CHPID is mapped to a channel with the same number. However this is not necessary because some OPPP machines support the ability to map CHPIDs with different numbers to the same channel or to map CHPIDs to channels beyond channel FF.

When you create or re-number CHPIDs in an OPPP processor, a *CHPID mapping* is used to determine what channel the CHPID should be mapped to. Each processor can have a different CHPID mapping. The default CHPID mapping is one-to-one between CHPID numbers and channel numbers.

To edit the CHPID mapping for an OPPP processor, edit the processor and click **CHPID Mapping** in the **Processor** dialog. This opens the **CHPID <> Channel Mapping** dialog.

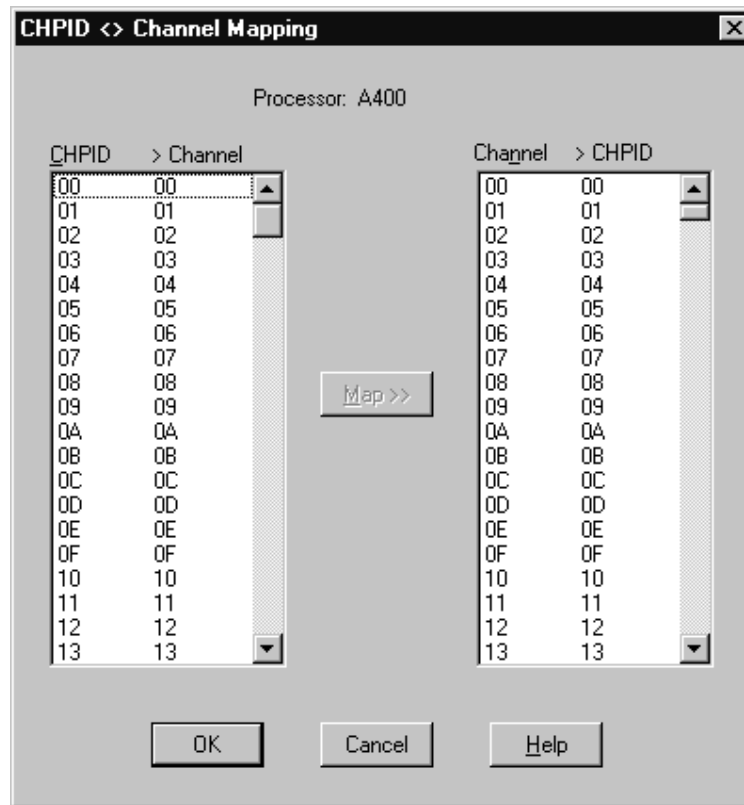


Figure 151. CHPID <> Channel Mapping Dialog

The listbox on the left lists all possible CHPID numbers (00- FF) and the channel numbers to which they map. The listbox on the right lists all possible channel numbers (00-1FF) and the CHPID numbers to which they map.

To change the mapping for a range of CHPID numbers, select the range in the left listbox and select the first channel number in the right listbox. Click **Map** to map the selected range of CHPID numbers to as many of channel numbers starting with the selected channel number.

If any of the target channel numbers is already mapped, the previous mapping is discarded. The previous CHPID numbers must be re-mapped before you can close this dialog (unless you press Cancel.)

After changing the CHPID mapping, any existing CHPIDs are remapped as appropriate.

## Connecting “One Processor Per Partition” Machines

When connecting to a channel on an OPPP machine, the connection is made to all CHPIDs that are mapped to that channel, and therefore also to the processors of those CHPIDs.

## CTC Connections to “One Processor Per Partition” Machines

When making a CTC connection to a channel on an OPPP machine that has more than one CHPID, HCM will prompt you to specify which CHPID (and therefore which processor) to make the connection to. To make CTC connections to several CHPIDs that map to one channel, follow the procedure for making a CTC connection once for each CHPID.



---

## Appendix D. Naming Conventions in Dialogs and Reports

Objects in HCM are usually described in dialogs, reports, on the configuration diagram, in the status bar, in the object information bar, and on certain menu items using a standard format. The format used for most situations is described below.

Object	Formatting convention (NAME)	Examples
Processor	ProcessorName	PROD1
Partition	ProcessorName.PartitionName	PROD1.LPARA
CHPID	ProcessorName.CHPID	PROD1.2F
Switch	SwitchName	ESCD_1
Switch Port	SwitchName.SwitchPortID	ESCD_1.E3
Crossbar	CrossbarName	PRN-XBAR
Crossbar Interface	CrossbarName.CrossbarInterfaceName	PRN-XBAR.1 (channel interface) PRN-XBAR.A1 (CU interface)
Controller	ControllerName	3990 #5
Controller Segment	ControllerName.SegmentName	3990 #5.SC0 "SEG" if none assigned by PDF
Controller (Channel / Device) Adapter	ControllerName.SegmentName.AdapterName "Segment Name" is omitted if none assigned by PDF "AdapterName" is "CA" "DA" if none assigned by PDF.	6110 #1.Bus 0.A (CA) 6110 #1.Bus 0.0 (DA)
Controller Interface	ControllerName.SegmentName.AdapterName.InterfaceName "INT" if none assigned by PDF	3990 #5.SC0.A 3990 #5.SC0.SP0 6110 #1.Bus 0.A.0 6110 #1.Bus 0.0.INT
String	StringName "String" plus range of device addresses if none assigned	BACKUP DASD String 500-51F
Unit	StringName.UnitName "Unit" plus range of device addresses if none assigned.	String 500-51F.Unit 500-507
Device	DeviceNumber or DeviceNumber,Count	0500 0500,8
String Interface	StringName.InterfaceName "INT" if none assigned by PDF	String 500-51F.A
Converter	ConverterName "S->P" or "P->S" if no label assigned	S->P between TEST1.22 and 3990 #1.SC0.C
Cabinet	CabinetName	Central Cabinet
Patchport	PortId	C101

In some situations, the formatted NAME as described above may be followed by additional information. The exact information that is included varies with circumstances.

Object	Formatting convention (NAME plus additional information)	Examples
Processor	ProcessorName TypeModel "Description" SN:Serial Number	PROD1 9021-972 "Production 1" SN: 1234569021
Partition (IBM style machine)	ProcessorName.PartitionName ImageNumber Usage "Description"	PROD1.LPARA 01 OS "OS Partition #1"
Partition (one processor per partition style machine)	ProcessorName.PartitionName TypeModel "Description"	PROD1.DOM1.3090 "Domain 1"
CHPID	ProcessorName.CHPID InterfaceType Type Mode "Description" Connections	PROD1.21 S CNC SHR "DIR 2.E8" to ESCD_2.E8
CHPID with no physical channel	ProcessorName.CHPID (No Channel) Type Mode "Description"	PROD1.21 (No Channel) ""
Physical channel with no CHPID	ProcessorName.CHPID InterfaceType (No CHPID) Connections	PROD1.21 S (No CHPID) to ESCD_2.E8
CHPID on one processor per partition machine	ProcessorName.CHPID InterfaceType (n CHPIDs) Connections	PROD1.21 S (3 CHPIDs) to ESCD_2.E8
Switch	SwitchName UnitModel "Description" SN:SerialNumber	ESCD_2 9032 "DASD Switch" SN:79023454
Switch Port	SwitchName.SwitchPortID LASER/LED "Name" Connections	ESCD_2.E8 LED "P1.21" from PROD1.21
Crossbar	CrossbarName SN:SerialNumber	PRN_XBAR SN: 0987242
Crossbar Interface	CrossbarName.CrossbarInterfaceName Connections	PRN_XBAR.A1 to 4245 #1.A
Controller	ControllerName SN:SerialNumber Strings	3990 #5 SN:98734789 reaching String 400-41F String 420-43F
Controller Segment	ControllerName.SegmentName Strings	3990 #5.SC0 reaching String 400-41F String 420-43F
Controller Interface	ControllerName.SegmentName.AdapterName.InterfaceName InterfaceType Connections	3990 #5.SC0.A S from ESCD_1.CD
String	StringName UnitModel Controllers "UnitModel" - taken from first device	String 500-51F 3390 on 3990 #5
Unit	StringName.UnitName UnitModel SN:SerialNumber "UnitModel" - taken from first device	String 500-51F.Unit 500-507 3390 SN:74329874
Device	DeviceNumber VOLSER	0500 489327
String Interface	StringName.InterfaceName Connections	String 500-51F.A from 3990 #5.SC0.SP0
Convertor	ConvertorName SN:SerialNumber Connections	P->S 293473284 between PROD1.06 and 3990 #11.SC1.A
Cabinet	CabinetName SN:SerialNumber	Central Cabinet 077349782

---

## Cable Descriptions

On the diagram, cable information will be in one of the following formats, depending on the zoom level:

Number of Lines showing	3	2	1
Short name and interface:	PR-54	PR-54	PR-54
Cable Identification:	5676	5676	
Cable length:	100		

Short name is the two letter abbreviation of the major object that the cable connects to.

In the above example; 100 is the length of the cable in unspecified units, 5676 is the cable identification and PR-54 identifies the cable connected to CHPID number 54 on the processor with the short name "PR".



---

## Appendix E. Menu Commands Summary

The menu choices are acting either on the *configuration work* (\*.HCM) file or on the *configuration production* (\*.HCR) file.

---

### File Menu

<u>O</u> pen...	Open an existing configuration (.HCM, .HCR) file and the corresponding IODF.
Open Special <u>_</u> ...	Open an existing configuration (.HCM, .HCR) file and a specified IODF.
<u>S</u> ave	Save the current configuration (.HCM, .HCR) file with a timestamp that is synchronized with the IODF, and continue the session with the files open.
<u>C</u> lose	Save the configuration (.HCM, .HCR) file and the corresponding IODF, and then close them.
IODF <u>D</u> etails...	Display important information about the IODF.
Copy to <u>B</u> ackup...	Copy the configuration (.HCM, .HCR) file to a new file and the corresponding IODF to a new data set.
Build <u>P</u> roduction...	Create a production IODF on the host out of the currently open work IODF, while at the same time creating a production (*.HCR) file out of the currently open work (*.HCM) file on the PWS.
Make <u>W</u> ork...	Create a work IODF on the host out of the currently open production IODF, while at the same time creating a work (*.HCM) file out of the currently open production (*.HCR) file on the PWS.
<u>I</u> ODFs...	Open a dialog to manage IODFs.
Page <u>S</u> etup...	Setup the page for printing purposes; setup the printer and its parameters.
Print <u>D</u> iagram...	Print the configuration diagram.
Print <u>R</u> eports...	Print reports and context diagrams.
Print Cable <u>L</u> abels...	Print cable labels to a text file or printer.
<u>I</u> mport Data...	Import new and changed non-HCM data into an existing or a new HCM configuration.
<u>E</u> xport Data...	Export configuration data to a text file in a directory.
<u>E</u> xit (Alt+F4)	Save and close the configuration (.HCM, .HCR) file and the corresponding IODF and exit HCM.

---

### Edit Menu

Undo last change (Alt+Backspace)	Undo the last change made to the configuration. This menu item's text specifies the action that is currently available to be undone. If the previous action cannot be undone, the item's text changes to "Can't Undo".
Delete/disconnect selected object (Del)	Delete the most recently selected object in the configuration diagram. This menu item's text changes to describe the most recently selected object. Shortcut: press the DEL key after selecting the object.
Edit selected object... (F9)	Edit the most recently selected object. This menu item's text changes to describe the most recently selected object. Shortcut: double-click the object in the diagram, or click on the object and press F9.

Edit cable on selected interface (F5)	Edit the cable on the most recently selected object. This menu item's text changes to describe the most recently selected object.
<u>P</u> rocessor...	Edit a particular processor.
<u>P</u> artition...	Edit a particular partition.
<u>C</u> HPID...	Edit a particular CHPID.
<u>S</u> witch...	Edit a particular switch.
<u>P</u> ort...	Edit a particular port.
Crossbar <u>S</u> witch...	Edit a particular crossbar switch.
<u>C</u> ontroller...	Edit a particular controller.
Control <u>U</u> nit...	Edit the controller containing a particular control unit.
<u>S</u> tring...	Edit a particular string.
<u>D</u> evice...	Edit a particular device.
<u>C</u> onverter...	Edit a particular converter.
Patchport...	Edit the cabinet containing a particular patchport.
<u>C</u> abinet...	Edit a particular cabinet.
<u>C</u> able Assignments...	Edit the cable assignments to connections.
<u>O</u> S Configurations...	Edit the OS configurations.
<u>C</u> TC connections...	Edit CTC connections.
<u>C</u> F connections...	Edit CF connections.
<u>P</u> PRC connections...	Edit Point-to-Point connections (PPRC connections).
<u>O</u> rders Processors...	Change the order of processors in the configuration diagram.
Titles & <u>F</u> ootnotes...	Edit the title and footnotes that appear in configuration diagrams and reports.
<u>M</u> anage Shadow Processors...	Edit the assignment of alternate (shadow) processors to physical machines.

---

## View Menu

Fit to Window (Ctrl+Home or F2)	Reduce the scale of the configuration diagram to fill the window.
Zoom Out (Home)	Reduce the scale of the configuration diagram by one step.
Zoom In (End)	Enlarge the scale of the configuration diagram by one step.
Actual Size (Ctrl+End)	Enlarge the scale of the configuration diagram to full size
<u>F</u> ilter Diagram...	Specify which objects are included in the diagram.
Highlighted Objects (F4)	Crop the diagram to show only those objects connected to the selected objects.
<u>V</u> isualized Matrices	Define a configuration for each ESCON or FICON switch or crossbar switch to be visualized.
<u>R</u> estore Named View (F3)	Select a saved named view to be shown as active configuration diagram.
<u>S</u> ave Named View	Save the displayed view.
<u>D</u> elete Named View	Delete a named view.
<u>R</u> estore Matrix Set	Select a saved named matrix view to be shown in the configuration diagram.
<u>S</u> ave Matrix Set	Save the current matrix set.
<u>D</u> elete Matrix Set	Delete a named matrix set.
<u>T</u> ext Detail...	Specify which text appears in the configuration diagram.
<u>P</u> references...	Set certain preferences for the configuration diagram.
<u>C</u> olors...	Enable/disable and set colors for visual warnings for logical/physical inconsistencies and for status information.

Object Information Bar  
Status Bar  
Show Page Breaks

Include or exclude the Object Information Bar.  
Include or exclude the Status Bar.  
Display the effects of page breaks and printer margins.

---

## Locate Menu

Selected object (F8)

Locate the most recently selected object. This menu item's text changes to describe the most recently selected object.

System

Locate a system in a sysplex. This menu item's text changes to describe the most recently selected object.

Processor...

Locate a particular processor

Partition...

Locate a particular partition

CHPID...

Locate a particular CHPID

| Switch...

Locate a particular switch

Port...

Edit a particular port.

Crossbar Switch...

Locate a particular crossbar switch

Controller...

Locate a particular controller.

Control Unit...

Locate the controller containing a particular control unit.

String...

Locate a particular string.

Device...

Locate a particular device.

Converter...

Locate a particular converter.

Patchport...

Locate the cabinet containing a particular patchport.

Cabinet...

Locate a particular cabinet.

| CTC connection...

Locate a particular CTC connection.

| CF connection...

Locate a particular CF connection.

| PPRC connection...

Locate a particular Point-to-Point connection (PPRC connection).

Cable...

Locate a particular cable.

---

## Create Menu

Processor...

Create a new processor.

| Switch...

Create a new switch.

Crossbar Switch...

Create a new crossbar switch.

Controller...

Create a new controller.

String...

Create a new string.

Cabinet...

Create a new cabinet.

CTC connection...

Create a new CTC connection.

CF connection...

Create a new CF connection.

| PPRC connection...

Create a Point-to-Point connection (PPRC connection).

---

## Operations Menu

Refresh

Obtain system status data

Sense

Obtain "sensed" data from the host

Focus on host...

Select the host for which the status information is to be displayed

Next focus on host

Jump to the next host as the focus host

Command...

Opens the I/O Operations command dialog window

Preferences...

Set preferences specific to I/O Operations

---

## Utilities

Move Port Connections...

Move port connections from a switch to another or within a single switch.

Aggregate CHPIDs...

Aggregate several CHPID definitions onto one single CHPID.

Convert ESCON Port to FC Port...

Migrate CNC channels to fiber channels.

Prime the IODF with Sensed Data...

Write sensed serial numbers and VOLSERS into the IODF.

Change CHPID Link Address Format...

Create a PPRC connection consisting of up to eight single PPRC links, and provide parameters for the PPRC connection.

---

## Options Menu

Confirmation...

Instruct HCM whether to prompt for a confirmation before deleting an object or disconnecting an interface.

Field Names...

Assign customized names to the user data fields.

Interface Selection...

Choose whether to select the object containing an interface or its cable when an interface is selected with the mouse.

Activate HCD Trace

Turn the HCD trace facility on or off.

---

## Help Menu

Index

Display the main HCM help topic index.

Keyboard

Describe the use of the Function keys and various cursor control key shortcuts.

Using Help

Open an index of topics that describe the Windows Help facility.

About...

Open a window describing the current release of HCM.

---

## Appendix F. Table Description for Tivoli Inventory Support

The following chapter describes the tables that were added to the Tivoli Inventory database in order to store the HCM exported data. The tables are also stored in the product directory [Drive]:\IBMEEQ\MIFUTIL\TABLDESC.TXT. The data type of all fields is VARCHAR. For the content of the fields refer to the description of the HCM exported data in “Table Summary” on page 299.

<b>Table name : HCM\$HW\$PROC</b>	
MIF-file name : EEQMIF00.MIF	
HCM exported file : PROC.TXT	
<b>Column name</b>	
PROC\$ID	PROC\$MODE
PROC\$GROUPED\$WITH	PROC\$NETWORK\$NAME
PROC\$STYLE	PROC\$CPC\$NAME
PROC\$STATUS	PROC\$USER\$FIELD1
PROC\$SHORT\$NAME	PROC\$USER\$FIELD2
PROC\$SERIAL\$NUMBER	PROC\$USER\$FIELD3
PROC\$DESCRIPTION	PROC\$USER\$FIELD4
PROC\$MODEL	PROC\$USER\$FIELD5
PROC\$SUPPORT\$LEVEL	

<b>Table name : HCM\$HW\$PART</b>	
MIF-file name : EEQMIF01.MIF	
HCM exported file : PART.TXT	
<b>Column name</b>	
PART\$ID	PART\$USER\$FIELD2
PART\$DESCRIPTION	PART\$USER\$FIELD3
PART\$NUMBER	PART\$USER\$FIELD4
PART\$USAGE	PART\$USER\$FIELD5
PART\$USER\$FIELD1	

<b>Table name : HCM\$HW\$CHPID</b>	
MIF-file name : EEQMIF02.MIF	
HCM exported file : CHPID.TXT	
<b>Column name</b>	
CHPID\$ID	CHPID\$MODE
CHPID\$UNIQUE\$KEY	CHPID\$DYN\$SWITCH
CHPID\$DESCRIPTION	CHPID\$PHYS\$NUMBER
CHPID\$TYPE	CHPID\$INT\$TYPE

<b>Table name : HCM\$HW\$DIR</b>	
MIF-file name : EEQMIF03.MIF	
HCM exported file : DIR.TXT	

<b>Column name</b>	
DIR\$ID	DIR\$USER\$FIELD1
DIR\$SERIAL\$NUMBER	DIR\$USER\$FIELD2
DIR\$DESCRIPTION	DIR\$USER\$FIELD3
DIR\$MODEL	DIR\$USER\$FIELD4
DIR\$CONTR\$LABEL	DIE\$USER\$FIELD5
DIR\$STRING\$LABEL	

<b>Table name : HCM\$HW\$PORT</b>	
MIF-file name : EEQMIF04.MIF	
HCM exported file : PORT.TXT	
<b>Column name</b>	
PORT\$ID	PORT\$INT\$TYPE
PORT\$UNIQUE\$KEY	PORT\$NAME

<b>Table name : HCM\$HW\$CONTRLLR</b>	
MIF-file name : EEQMIF05.MIF	
HCM exported file : CONTRLLR.TXT	
<b>Column name</b>	
CONTR\$LABEL	CONTR\$INTEGRATED
CONTR\$SER\$NUM	CONTR\$GROUPED\$WITH
CONTR\$DEV\$TYPE	CONTR\$USER\$FIELD1
CONTR\$IODF\$CUT (CU type)	CONTR\$USER\$FIELD2
CONTR\$PDF\$ABID (abbrevid)	CONTR\$USER\$FIELD3
CONTR\$PDF\$NAME	CONTR\$USER\$FIELD4
CONTR\$DISP\$CLASS	CONTR\$USER\$FIELD5
CONTR\$INSTALLED	

<b>Table name : HCM\$HW\$CCI</b>	
MIF-file name : EEQMIF06.MIF	
HCM exported file : CCI.TXT	
<b>Column name</b>	
CCI\$INT\$NAME	CCI\$INTERFACE\$TYPE
CCI\$UNIQUE\$KEY	

<b>Table name : HCM\$HW\$CDI</b>	
MIF-file name : EEQMIF07.MIF	
HCM exported file : CDI.TXT	
<b>Column name</b>	
CDI\$INT\$NAME	CDI\$UNIQUE\$KEY

<b>Table name : HCM\$HW\$CU</b>	
MIF-file name : EEQMIF08.MIF	
HCM exported file : CU.TXT	
<b>Column name</b>	
CU\$ID	CU\$DESCRIPTION
CU\$CONTAINER	CU\$TYPE
CU\$SERIAL\$NUMBER	

<b>Table name : HCM\$HW\$STRING</b>	
MIF-file name : EEQMIF09.MIF	
HCM exported file : STRING.TXT	
<b>Column name</b>	
STRING\$TAG	STRING\$USER\$FIELD1
STRING\$IODEF\$DT (device type)	STRING\$USER\$FIELD2
STRING\$PDF\$ABID (abbrevid)	STRING\$USER\$FIELD3
STRING\$PDF\$NAME	STRING\$USER\$FIELD4
STRING\$LABEL	STRING\$USER\$FIELD5
STRING\$INSTALLED	

<b>Table name : HCM\$HW\$SI</b>	
MIF-file name : EEQMIF0A.MIF	
HCM exported file : SI.TXT	
<b>Column name</b>	
SI\$INT\$NAME	SI\$UNIQUE\$KEY

<b>Table name : HCM\$HW\$UNIT</b>	
MIF-file name : EEQMIF0B.MIF	
HCM exported file : UNIT.TXT	
<b>Column name</b>	
UNIT\$TAG	UNIT\$USER\$FIELD2
UNIT\$SERIAL\$NUMBER	UNIT\$USER\$FIELD3
UNIT\$LABEL	UNIT\$USER\$FIELD4
UNIT\$INSTALLED	UNIT\$USER\$FIELD5
UNIT\$USER\$FIELD1	

<b>Table name : HCM\$HW\$DEVICE</b>	
MIF-file name : EEQMIF0C.MIF	
HCM exported file : DEVICE.TXT	
<b>Column name</b>	
DEVICE\$ID	DEVICE\$DESCRP
DEVICE\$CONTAINER	DEVICE\$VOLSER
DEVICE\$SER\$NUMBER	DEVICE\$TYPE

<b>Table name : HCM\$HW\$XBAR</b>	
MIF-file name : EEQMIF0D.MIF	
HCM exported file : XBAR.TXT	
<b>Column name</b>	
XBAR\$LABEL	XBAR\$USER\$FIELD1
XBAR\$NUMOF\$CI	XBAR\$USER\$FIELD2
XBAR\$NUMOF\$CUI	XBAR\$USER\$FIELD3
XBAR\$SERIAL\$NUMBER	XBAR\$USER\$FIELD4
XBAR\$SHORT\$NAME	XBAR\$USER\$FIELD5
XBAR\$DEFAULT\$CFG	

<b>Table name : HCM\$HW\$XBARCFG</b>	
MIF-file name : EEQMIF0E.MIF	
HCM exported file : XBARCFG.TXT	
<b>Column name</b>	
XBARCFG\$NAME	XBARCFG\$ROW17\$CI
XBARCFG\$ROW1\$CI	XBARCFG\$ROW18\$CI
XBARCFG\$ROW2\$CI	XBARCFG\$ROW19\$CI
XBARCFG\$ROW3\$CI	XBARCFG\$ROW20\$CI
XBARCFG\$ROW4\$CI	XBARCFG\$ROW21\$CI
XBARCFG\$ROW5\$CI	XBARCFG\$ROW22\$CI
XBARCFG\$ROW6\$CI	XBARCFG\$ROW23\$CI
XBARCFG\$ROW7\$CI	XBARCFG\$ROW24\$CI
XBARCFG\$ROW8\$CI	XBARCFG\$ROW25\$CI
XBARCFG\$ROW9\$CI	XBARCFG\$ROW26\$CI
XBARCFG\$ROW10\$CI	XBARCFG\$ROW27\$CI
XBARCFG\$ROW11\$CI	XBARCFG\$ROW28\$CI
XBARCFG\$ROW12\$CI	XBARCFG\$ROW29\$CI
XBARCFG\$ROW13\$CI	XBARCFG\$ROW30\$CI
XBARCFG\$ROW14\$CI	XBARCFG\$ROW31\$CI
XBARCFG\$ROW15\$CI	XBARCFG\$ROW32\$CI
XBARCFG\$ROW16\$CI	

<b>Table name : HCM\$HW\$XCI</b>	
MIF-file name : EEQMIF0F.MIF	
HCM exported file : XCI.TXT	
<b>Column name</b>	
XCI\$INT\$NAME	XCI\$UNIQUE\$KEY

<b>Table name : HCM\$HW\$XCUI</b>	
MIF-file name : EEQMIF10.MIF	
HCM exported file : XCUI.TXT	
<b>Column name</b>	
XCUI\$INT\$NAME	XCUI\$UNIQUE\$KEY

<b>Table name : HCM\$HW\$CABINET</b>	
MIF-file name : EEQMIF11.MIF	
HCM exported file : CABINET.TXT	
<b>Column name</b>	
CABINET\$ID	CABINET\$US\$FLD1
CABINET\$DESCRIPTION	CABINET\$US\$FLD2
CABINET\$MODEL	CABINET\$US\$FLD3
CABINET\$SER\$NUM	CABINET\$US\$FLD4
CABINET\$GRP\$POS	CABINET\$US\$FLD5

<b>Table name : HCM\$HW\$PATCHPRT</b>	
MIF-file name : EEQMIF12.MIF	
HCM exported file : PATCHPRT.TXT	
<b>Column name</b>	
PATCHPRT\$NAME	PATCHPRT\$EX\$LAB
PATCHPRT\$UN\$KEY	PATCH\$PRT\$INST
PATCHPRT\$CABINET	

<b>Table name : HCM\$HW\$CONVERTR</b>	
MIF-file name : EEQMIF13.MIF	
HCM exported file : CONVERTR.TXT	
<b>Column name</b>	
CONVERTR\$LABEL	CONVERTR\$US\$FLD1
CONVERTR\$UN\$KEY	CONVERTR\$US\$FLD2
CONVERTR\$TYPE	CONVERTR\$US\$FLD3
CONVERTR\$POS	CONVERTR\$US\$FLD4
CONVERTR\$SER\$NUM	CONVERTR\$US\$FLD5

<b>Table name : HCM\$HW\$CABLE</b>	
MIF-file name : EEQMIF14.MIF	
HCM exported file : CABLE.TXT	
<b>Column name</b>	
CABLE\$ID	CABLE\$LOSS\$A
CABLE\$TYPE	CABLE\$LOSS\$B
CABLE\$LENGTH	CABLE\$COMMENT

<b>Table name : HCM\$HW\$LOGLINK</b>	
MIF-file name : EEQMIF15.MIF	
HCM exported file : LOGLINK.TXT	
<b>Column name</b>	
LOGLINK\$SOURCE	LOGLINK\$TAR\$TYPE
LOGLINK\$SRC\$TYPE	LOGLINK\$TAR\$UK
LOGLINK\$SRC\$UK	LOGLINK\$TRM\$LOSS
LOGLINK\$TARGET	LOGLINK\$REC\$LOSS

<b>Table name : HCM\$HW\$CONNECT</b>	
MIF-file name : EEQMIF16.MIF	
HCM exported file : CONNECT.TXT	
<b>Column name</b>	
CONNECT\$SOURCE	CONNECT\$STAR\$UK
CONNECT\$SRC\$TYPE	CONNECT\$LLTAR\$UK
CONNECT\$SRC\$UK	CONNECT\$SEQUENCE
CONNECT\$TARGET	CONNECT\$CABLE\$ID
CONNECT\$STAR\$TYPE	CONNECT\$PERMANENT

<b>Table name : HCM\$HW\$DEVCU</b>	
MIF-file name : EEQMIF17.MIF	
HCM exported file : DEVCU.TXT	
<b>Column name</b>	
DEVCU\$DEVICE\$ID	DEVCU\$CU\$ID

<b>Table name : HCM\$HW\$CUCHPID</b>	
MIF-file name : EEQMIF18.MIF	
HCM exported file : CUCHPID.TXT	
<b>Column name</b>	
CUCHPID\$CU\$ID	CUCHPID\$DLA
CUCHPID\$CHP\$ID	CUCHPID\$DLA\$SET

<b>Table name : HCM\$HW\$DEVIMAGE</b>	
MIF-file name : EEQMIF19.MIF	
HCM exported file : DEVIMAGE.TXT	
<b>Column name</b>	
DEVIMAGE\$DEV\$ID	DEVIMAGE\$LN\$TYPE
DEVIMAGE\$IM\$ID	

<b>Table name : HCM\$HW\$PANEL</b>	
MIF-file name : EEQMIF1A.MIF	
HCM exported file : PANEL.TXT	
<b>Column name</b>	
PANEL\$ID	PANEL\$NUMOF\$ROW
PANEL\$DESC	PANEL\$NUMOF\$COL
PANEL\$NAM\$FORM	PANEL\$SR\$1ST

**Table name :** HCM\$HW\$PPRCLINK

MIF-file name : EEQMIF1B.MIF

HCM exported file : PPRCLINK.TXT

**Column name**

PPRCLINK\$SOURCE\$IF

PPRCLINK\$DESC

PPRCLINK\$SOURCE\$CU

PPRCLINK\$DEVN

PPRCLINK\$TARGET\$CU

PPRCLINK\$PRIM\$SSID

PPRCLINK\$LINK\$ADDR

PPRCLINK\$SEC\$SSID

PPRCLINK\$CUADD

PPRCLINK\$LINK



---

## Appendix G. Special Setup Considerations

The following allows special individual adaptation for setup. In general, it is not necessary to use these parameters. They are provided for special purposes.

Usually, only AJCLACCT or RTIMEOUT for [CBDQAGNT] are of interest for common purposes. The other keywords are mainly for debugging purposes.

---

### HCM Client: Configurable Login Parameters

The only login parameter needed is the TCP/IP hostname of the MVS host running the HCM dispatcher. If no port is specified (port = 0), the client will use the pre-configured default port number 51107 to contact the HCM dispatcher.

During HCM login, the HCM client reads the HCM Windows eeqhcm.ini file, which resides in the Windows system directory (e.g., c:\winnt\eeqhcm.ini) to access optional parameters for the login request.

The following parameters can be defined for the sections [COMRDTS], [CBDQTDIS] and [CBDQAGNT]:

**[COMRDTS] AGENTLOG=<path-of-client-logfile>**

This activates the writing of an HCM client log to the specified path and filename. Directories specified in the path must already exist. The client log can be helpful in diagnosing HCM login problems.

Example: AGENTLOG=c:\hcm\client.log

**[CBDQTDIS] RTIMEOUT=<seconds>**

This defines the number of seconds the HCM client waits for an answer from the HCM dispatcher after sending an HCM login request and before reporting a timeout error. The default is RTIMEOUT=90. On slow networks or when the priority of the dispatcher is low, this timeout value may have to be increased.

**[CBDQTDIS] ATIMEOUT=<seconds>**

The HCM dispatcher starts a new HCM agent by writing the agent job to the JES internal reader. It then attempts to contact the new agent to verify successful startup. The ATIMEOUT parameter specifies the number of seconds the dispatcher will wait for the agent to start before reporting a failure to the waiting HCM client. The default is ATIMEOUT=60. If the JES input queue is slow in starting the submitted agent job, this value may have to be increased.

**[CBDQAGNT] AJCLSKEL=<HCM agent skeleton JCL data set>**

This overwrites the default JCL skeleton used by the HCM dispatcher to generate the HCM agent job. This can be used, for example, to start an HCM agent with an experimental version of the HCDPROF data set (instead of the default &SYSUID..HCD.PROFILE).

Fully qualified MVS data set names must be specified within two pairs of single quotes, for example: AJCLSKEL='TEST.CBDQAGNT.JST'

**[CBDQAGNT] AJCLASS=<job class of HCM agent>**

This overwrites the default job class (0) of the generated HCM agent job. It can be used to save the job output of the HCM agent by specifying, for example, 'AJCLASS=A'.

**[CBDQAGNT] AMCLASS=<agent job message class>**

This defines the message class parameter in the JOB statement of the generated agent JCL. The default message class is "0". It may be necessary to specify a different job message class in order to obtain a job log for the HCM agent. Example: AMCLASS=H

**[CBDQAGNT] RTIMEOUT=<seconds>**

This defines the number of seconds the HCM client waits for an answer from the HCM agent after sending a request and before reporting a timeout error. The default is RTIMEOUT=600. For long-running HCD requests, this timeout value may have to be increased.

**[CBDQAGNT] ATIMEOUT=<seconds>**

When a new HCM agent is started, it is first contacted by the HCM dispatcher. After sending a ready notification to the dispatcher, the agent then waits to be contacted by the HCM client. If the agent is not contacted by the client after the specified timeout value (e.g., the HCM user accidentally hits power-off on the PC), the agent will terminate. The default is ATIMEOUT=60. On slow networks, this value may have to be increased.

**[CBDQAGNT] AJCLACCT=<accounting information>**

This defines the accounting information parameter in the JOB statement of the generated agent JCL. If the installation requires accounting information, it may be necessary to supply this parameter if the default accounting information supplied by the HCM dispatcher is invalid for the individual HCM user. Example: AJCLACCT=(DE03160,,)

**[CBDQAGNT] AREGION=<agent job region size>**

This defines the region parameter in the JOB statement of the generated agent JCL. The default region size is AREGION=128M.

**[CBDQAGNT] ALOGDSN=<name of agent log data set>**

This defines the name of a log data set written by the HCM agent. The default is that no log output is written. Log output may be helpful in diagnosing communication problems between the HCM client and the HCM agent.

**Example 1: ALOGDSN=CBDQAGNT.LOG**

Writes the agent log as CBDQAGNT.LOG under the user's HLQ

**Example 2: ALOGDSN='TEMP.CBDQAGNT.LOG'**

Writes the agent log as 'TEMP.CBDQAGNT.LOG' (fully qualified)

**Example 3: ALOGDSN=DD:SYSOUT**

Writes the agent log to the job log output

**[CBDQAGNT] HCDPROF=<DD specification of HCD profile data set>**

This defines the DD specification of the HCD profile used by the HCM agent. The default is:

```
HCDPROF="//HCDPROF DD DISP=SHR,DSN=&SYSUID..HCD.PROFILE"
```

Specifying this parameter allows the use of an alternate HCD profile, e.g.,

```
HCDPROF="//HCDPROF DD DISP=SHR,DSN=&SYSUID..MYHCD01.PROFILE"
```

**[CBDQAGNT] HCDTRACE=<DD specification of HCD trace data set>**

This defines the DD specification of the HCD trace data set used by the HCM agent. The default is:

```
HCDTRACE="//HCDTRACE DD DISP=SHR,DSN=&SYSUID..HCM.TRACE"
```

Specifying this parameter allows the use of an alternate HCD trace data set, e.g.,

```
HCDTRACE="//HCDTRACE DD DISP=SHR,DSN=&SYSUID..MYHCM01.TRACE"
```

**[CBDQAGNT] ASTEPLIB=<name of steplib data set>**

This defines a data set name which is appended to the STEPLIB concatenation. Per default, there is no additional steplib data set.

Example: ASTEPLIB=BMGN.MY.LOADLIB

---

## HCM Ini File: EEQHCM.INI

The HCM INI file (EEQHCM.INI) is created after the first successful HCM session. Usually, this is sufficient. There might be situations, however, when you need an INI file for the first login request. In this case, you can simply use an editor and create the INI file manually with the desired contents. For example (c:\winnt\eeqhcm.ini):

```
[HCM]
ERRLOGDIR=c:\HCMLOG
[CBDQAGNT]
RTIMEOUT=6000
AJCLACCT=(DE03160,,)
[COMRDTs]
AGENTLOG=c:\hcmlog\tstLOG.LOG
```

**Note:** If you get timeout messages (like EEQX305E or EEQX414E) when trying to establish an HCM-HCD session for the first time, increasing timeout values in the ini file might not help, because the defaults are usually sufficient. The problem might lie in the TCP/IP configuration/customization (LE environment, DNS name server, etc.). First check the reason for the timeout before increasing the defaults. See Chapter 18, "Problem Determination" on page 345 for more details.

---

## Host Messages

The following messages can be issued by either the HCM dispatcher or the HCM agent on the host. These messages will be written to the sdsf console (issued as a WTO message).

**CBDG980I CBDQTDIS -- HCM dispatcher starting, port = <port>**

The HCM dispatcher is starting and will listen for start-agent requests on the specified TCP/IP port.

**CBDG981E CBDQTDIS -- can't listen on port <port>**

The HCM dispatcher cannot bind to the specified port and will terminate. The port number may be in use by another program.

Restart the HCM dispatcher, possibly specifying a different (available) port number.

**CBDG982I CBDQTDIS -- HCM dispatcher terminating.**

The HCM dispatcher is terminating.

**CBDG983I CBDQTDIS -- start-agent request for user <user\_id> received.**

The HCM dispatcher received an HCM start-agent request from a client for the specified user ID.

**CBDG984I CBDQTDIS -- HCM agent started for user <user\_id>, port <port>.**

The HCM dispatcher successfully started an HCM agent for the specified client user ID. The new HCM agent instance listens on the specified TCP/IP port number.

**CBDG985I CBDQTDIS -- HCM validation for client user id <user\_id> failed.**

The HCM dispatcher could not successfully validate the HCM start-agent request for the specified user. Either the dispatcher is not running as an authorized program or the login information specified by the client is invalid.

For operators: make sure that the HCM dispatcher is being run from an authorized library.

For users: check the spelling of your user ID and password. Also check whether your TSO password has expired. Then retry the HCM client login.

**CBDG986I CBDQAGNT -- HCM agent starting, port = <port>**

An instance of the HCM agent was started successfully and is expecting HCM requests on the specified TCP/IP port number.

**CBDG987I <module\_name> <variable\_text>**

The text of this message provides additional information for an already issued message (CBDG980I to CBDQG986I). The content of this message depends on the situation.

---

## HCM Client: TCP/IP Related Messages

Messages indicating a problem related to the TCP/IP communication between the HCM client on the workstation and the HCD server on the host have the message identifiers EEQX100E to EEQX503E. For the message text see Appendix A, "HCM Messages" on page 355.

---

## Appendix H. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in z/OS enable users to:

- Use assistive technologies such as screen-readers and screen magnifier software
- Operate specific or equivalent features using only the keyboard
- Customize display attributes such as color, contrast, and font size

---

### Using assistive technologies

Assistive technology products, such as screen-readers, function with the user interfaces found in z/OS. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.

---

### Keyboard navigation of the user interface

Users can access z/OS user interfaces using TSO/E or ISPF. Refer to *z/OS TSO/E Primer*, *z/OS TSO/E User's Guide*, and *z/OS ISPF User's Guide Volume I* for information about accessing TSO/E and ISPF interfaces. These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.



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## LookAt System for Online Message Lookup

LookAt is an online facility that allows you to look up explanations for z/OS messages and system abends.

Using LookAt to find information is faster than a conventional search because LookAt goes directly to the explanation.

LookAt can be accessed from the Internet or from a TSO command line.

You can use LookAt on the Internet at:

<http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/lookat.html>

To use LookAt as a TSO command, LookAt must be installed on your host system. You can obtain the LookAt code for TSO from the LookAt Web site by clicking on the **News and Help** link or from the *z/OS Collection*.

To find a message explanation from a TSO command line, simply enter: **lookat message-id** as in the following:

```
lookat eeqx401e
```

This results in direct access to the message explanation for message EEQX401E.

To find a message explanation from the LookAt Web site, simply enter the message ID. You can select the release if needed.

**Note:** Some messages have information in more than one book. For such messages, LookAt prompts you to choose which book to open.



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## Glossary

This glossary defines technical terms and abbreviations used in the Hardware Configuration Manager documentation. If you do not find the term you are looking for, refer to the index of the appropriate HCD manual or view the *IBM Glossary of Computing Terms*, available from: <http://www.ibm.com/ibm/terminology>.

### A

**access list.** A CHPID has two partition lists: Access and Candidate. If a CHPID is either shared or reconfigurable, you can specify which partitions have access to that CHPID. Use the CHPID Access list with or without the CHPID Candidate list.

That is, CHPIDs are assigned to partitions by adding each partition to the CHPID's Access or Candidate list. A partition has initial access to a CHPID if the logical partition is on that CHPID's Access list.

**actual size.** Actual Size scales the diagram so that objects are viewed at their approximate size when a diagram is printed at full size.

**alternate processor.** Alternate refers to a processor which is not the current logical view of its assigned machine.

### B

**button.** Dialog option: click on button to carry out action. OK, Cancel and Help buttons appear in almost every dialog. Clicking OK will close the dialog. If you have more than one dialog open, click OK or Cancel, or press the ESC key repeatedly to close all dialogs and return to the diagram.

### C

**cabinet.** Cabinets, also known as fiber management cabinets contain *panels* organized into *port groups* of *patchports*, which are pairs of fibre adapters or couplers. Cabinets are used to organize long, complex cables between processors and controllers, which may be as far away as different buildings. In the configuration diagram, cabinets are shown on the far right.

**cable "in inventory".** You can put unused cables *into inventory*; HCM will not "remember" the past usage of these cables. Cables in inventory are cables that are generally available for use to any object.

**candidate list.** A partition can gain access to a CHPID if the partition is on that CHPID's Candidate list. A

partition is allowed to configure a CHPID online if the logical partition is on that CHPID's Candidate list.

| See also *access list*.

**channel adapter.** A *channel adapter* groups two or more controller channel interfaces electronically.

**channel interface.** See [Controller] channel interface or [Crossbar] channel interface.

**check box.** Dialog option: click in the check box to select or de-select the item.

**CHPID.** A logical processor contains a number of *CHPIDs*, or Channel Path IDs, which are the logical equivalent of channels in the physical processor.

**CHPID mapping.** Usually, a processor can have up to 256 channels and 256 CHPIDs, so there is a 1:1 mapping. However, in processors of the "one processor per partition" style, there can be up to 512 channels or the relationship between CHPIDs and channels may not be one to one. The default is to map the CHPIDs to the first 256 channels, but you may specify a non-standard *CHPID mapping*.

**CHPID type.** The logical *CHPID type* typically corresponds to a physical path interface type.

**cluster.** See *segment*.

**config file.** The *config file* (\*.HCM file) contains HCM's interactive configuration diagram. You can modify and save different versions of your hardware configuration in a number of config files for historical and planning purposes. The config file is also called *work configuration file*. See also *work configuration file*, and *configuration files*.

**configuration diagram.** From the IODF on the host, HCM constructs an interactive *configuration diagram* to help you visualize and more easily maintain your system. You can add or modify objects in the diagram to more accurately represent your hardware configuration. You can also print out wall charts or reports to plan and implement future modifications to your system.

**configuration files.** The *configuration files* refer to work configuration files (\*.HCM file) as well as to production configuration files (\*.HCR file). They are equivalent to the work and production IODFs, but are located on the PWS. See also *work configuration file*, *config file*, and *production configuration file*.

**context diagram.** A *context diagram* is a configuration diagram showing the object of interest and all

equipment connected to it. Think of a context diagram as the configuration as seen by this object.

**cropped.** A *cropped* diagram includes a subset of the entire configuration comprising the selected object(s) and any objects that they connect to.

**controller.** A *controller* translates high level requests from processors to low level requests to I/O devices, and vice versa. Each physical controller contains one or more logical *control units*, channel and device interfaces, and a power source.

Controller *channel interfaces* can connect to the CHPIDs on one or more processors; controller *device interfaces* can connect to the string interfaces on one or more strings of I/O devices.

Controllers can be divided into *segments*, or grouped into *subsystems*.

**[controller] channel interface.** A *controller* has a number of *channel interfaces* on the top which can be physically connected and logically defined to CHPIDs on processors, possibly via control unit interfaces on crossbar switches (if parallel / bus and tag), ports on switches (if serial / ESCON or FICON), or converters (if connecting parallel <=> serial interfaces or vice versa). Note that the serial physical cables connecting the controller and processor(s) may travel through cabinets via patchports.

**control unit.** Each physical controller contains one or more *control units*, which translate high level requests to low level requests between processors and devices.

**control unit interface.** A crossbar switch has a number of control unit interfaces on its side which can connect to channel interfaces on controllers.

**converter [P→S, S→P].** There are two types of *converter*: those that are used to connect serial ESCON cables to parallel bus-and-tag cables (9034 or S→P), and those that connect parallel to serial cables (9035, or P→S).

HCM automatically creates and connects converters when necessary. HCM maintains an inventory of converters currently in use or that were used for connections which have been subsequently disconnected.

**coupling facility.** The *coupling facility* is the hardware element that provides high speed caching, list processing, and locking functions in a sysplex. To enable data sharing between a CF partition and the central machines, special types of high speed CF channels are required. A CFR channel path attached to a CF partition can be connected to a CFS channel path attached to a partition in which an operating system is running. Besides CF connections between a CFR and CFS channel path, CF connections can also be established between two CFP channel paths.

**[crossbar] channel interface.** A crossbar switch has a number of *channel interfaces* on top which can connect to processor CHPIDs either directly or via other crossbars.

**crossbar configuration.** You can document different settings of crossbar switch connectivity as *crossbar configurations*.

**crossbar switch.** A *crossbar switch* is a static switch such as an IBM 3814 that can connect controllers to processors with parallel (bus and tag) interfaces. The crossbar contains a number of *channel interfaces* on its top, which can connect to objects above it such as processors or other crossbars. The crossbar switch also contains a number of *control unit interfaces* on its side, which can connect to objects below it such as controllers or other crossbars.

**crossbar switch connectivity.** The *switch connectivity* comprises which crossbar channel interfaces are connected to which control unit interfaces; that is, which internal intersections in the crossbar are active.

**CTC connection (channel to channel connection).** You can create a CTC connection (channel-to-channel connection) between two CHPIDs on the same or different processors, either directly or through a switch. When connecting through a switch, both CHPIDs must be connected through the same or a chained switch. One CHPID must be CNC or FCV, the other CTC in case of an SCTC connection. For FCTC connections, two FC CHPIDs have to be connected.

HCM considers a CTC connection as a single entity comprising selected control units and I/O devices in the connected processors.

## D

**dedicated CHPID.** A CHPID can be *dedicated* to one partition; only that partition can access I/O devices on this CHPID. All CHPID types can operate in DED (dedicated) mode.

**device.** See I/O Device.

**device adapter.** A *device adapter* groups two or more controller device interfaces electronically.

**device interface.** A *controller* has a number of *device interfaces* on the bottom which can connect to string interfaces on strings of I/O devices.

**dialog.** A *dialog* is an interactive pop-up window containing *options* which allow you to browse or modify information, take specific action relating to selected objects, or access other dialogs. HCM provides a series of dialogs to help you create, edit, delete, and connect objects, as well as manipulate the configuration diagram.

**disconnect.** A controller channel interface may be *disconnected* from a CHPID with either a *standard disconnection* or a *physical-only disconnection*. The standard disconnection involves logically disconnecting any control units from any CHPIDs that were only reachable via the controller channel interface, as well as physically disconnecting the controller from the processor.

**drop down list box.** Dialog option: click on the arrow icon, select an item from the list that drops down; your selection appears in the text box adjacent.

**drop down box.** Dialog option: click on the arrow icon, select an item from the list that drops down; your selection appears in the text box adjacent. Alternatively, type in the text box.

## E

**edit dialog.** Type of dialog allowing you to edit data for a selected object.

**ESCON switch.** See switch.

**extend-select.** You can select more than one item in some list boxes. Hold down the SHIFT key while dragging the cursor over several sequential list box items (*extend selection*). See Multi-select.

## F

**Fiber link.** Fiber links are the physical fiber optic connections and transmission media between optical fiber transmitters and receivers. A fiber link can comprise one or more fiber cables and patchports in fiber management cabinets. Each connection in the fiber link is either permanent or mutable.

**Ficon switch.** See switch

**fiber management cabinet.** See Cabinet.

**fit to window.** *Fit to Window* scales the diagram to completely fit in the display window.

**full size.** *Full size*, or 100% scale, is the largest scale for printing diagrams. At this size, each controller will be about one inch tall.

## H

**HCD.** The Hardware Configuration Definition (*HCD*) is an interactive interface on the host which allows you to define the hardware configuration for both the channel subsystem and operating system.

**head of string.** The *head of string* is the first unit of devices in a string. It contains the string interfaces which connect to controller device interfaces.

**independent controller.** An *independent controller* is a subsystem which contains only that controller.

**integrated device.** Devices are said to be *integrated* into the control unit or controller if they are not attached to the controller by cables (for example, 3800 printers and TP lines defined in a 37x5).

**interface type.** The *interface type* is the physical path interface type usually corresponding to a particular CHPID type. Interface types include serial, parallel, coupling, IOC and OSA.

**internal control units.** See *switch's control unit*

**internal devices.** See *switch's devices*

**internal structures.** The controller and string structures used by HCM as containers for a switch's control units and devices are called the *internal structures*.

**I/O device.** An *I/O device* can be a printer, tape drive, hard disk drive, and so on. Devices are logically grouped inside *units*, which are in turn grouped into *strings*. The first unit, known as the *head of string*, contains *string interfaces* which connect to controller device interfaces and eventually to processor CHPIDs. Devices are represented as lines of text within the appropriate unit object in the configuration diagram.

**IODF.** The input/output definition file (*IODF*) file on the host contains processor and operating system I/O definitions, describing all logical objects and their connectivity in the hardware configuration.

## J

**jumper cable.** Fiber *jumper cables* are usually used to make mutable connections between patchports.

## L

**load [IODF load].** You can *load* IODF data from the host to the PWS, for HCM to use when creating the interactive configuration diagram for that hardware configuration. The selected IODF file is loaded into an empty PWS configuration.

**logical definition.** You can create logical definitions for objects which are physically connected and therefore, reachable. Logical definitions represent the connectivity between logical objects in the processor's logical view of the hardware configuration.

**logical object.** Logical objects belong to the processor's logical view of the hardware configuration. Generally, logical objects correspond to physical objects. For example, the logical processor has an associated

physical processor (machine), and logical CHPIDs have corresponding physical channels. However, there are exceptions: logical partitions have no physical equivalent. Physical cabinets, patchports, or crossbar switches have no logical equivalents.

## M

**machine.** The *machine* is a single physical machine; a system configuration that consists of all the machines required for operation; for example, a processor unit, a processor controller, a system display, a service support display, and a power and coolant distribution unit.

A machine may have more than one processor associated with it, one of which will be the *primary* processor, the rest *alternate* or “shadow” processors.

**Note:** A machine of the style “one processor per partition” may have more than one primary processor.

**menu.** A *menu* is a drop down list box containing *menu commands*. Click on a *menu title* in the menu bar at the top of the HCM screen to display the menu. Alternatively, hold down the ALT key and press the character key corresponding to the underlined letter in the menu title. For example, ALT+F for File menu.

Select a command by clicking on it; pressing the character key corresponding to the underlined letter in the command, or; pressing up or down arrow keys until the desired command is highlighted, then pressing ENTER.

**mode name.** The name of the communication mode. This parameter is the same as the mode name on the host (logname). This name must match a value defined at the host.

**multiple exposure device.** A *multiple exposure device* is allocated by a single device number, but accessed by several device numbers, where each device number represents one *exposure*. The device number by which the device is allocated is the *base exposure*; all other device numbers are called *non-base exposures*.

**multi-select.** You can select more than one item in some list boxes. Press the CTRL key while clicking on list box items which may or may not be in sequence (*multi-select*). See Extend-select.

**mutable connection.** *Mutable connections* are usually made with fiber jumper cables between patchports in a cabinet or between cabinets and active objects such as CHPIDs, switches, converters and controllers with ESCON or FICON interfaces. Mutable connections are broken when the patchports they connect are not in use.

## N

**navigation dialog.** Type of dialog allowing you to navigate to related dialogs.

## O

**online mode.** The mode of operation when a connection to a host session (running HCD) is established for HCM.

**option button.** Dialog option: click on the button to select the option; all other options will be de-selected.

## P

**panel.** Each cabinet can have one or more *panels*, arranged one above the other. Panels are organized into *port groups* of *patchports*. They can be numbered starting from zero or one, from the top or the bottom of the cabinet.

**panel space.** A cabinet has a number of places to hold panels, called *panel spaces*.

**partition.** The logical processor may be divided into a number of logical *partitions* (LPARs). Each partition has access to the processor’s resources for a limited amount of time. Partitions may be restricted from using certain CHPIDs and allowed to use others, by being assigned to each CHPID’s Access or Candidate Lists. Restricting partitions to certain subsets of CHPIDs can provide system security; for example, company departments may each be assigned to a different partition.

**patchport.** A *patchport* comprises a pair of fibre adapters or couplers. Any number of patchports can participate in an *ESCON link*. The total number of patchports in a cabinet is the *number of panels* multiplied by the *number of port groups in each panel* multiplied by the *number of patchports in each port group*.

**peer-to-peer remote copy.** PPRC (peer-to-peer remote copy) connections are direct connections between DASD controller subsystems that are used primarily to provide a hot standby capability. These connections can be point-to-point from one DASD controller to another, or they may pass through switches, just as connections from CHPIDs to control units can.

**permanent connection.** *Permanent connections* are usually made between cabinets with fiber trunk cables. Patchports that are permanently connected remain so even when they are not in use.

**physical description.** A *physical description* is a template associated with a controller which describes its physical characteristics, for example, how to label controller interfaces. Most controllers can be associated with the generic physical description built into HCM. For those common IBM controllers unable to use the

generic description, other physical descriptions are provided. Sample templates or *PDFs* (physical description files) for other equipment are provided as examples to allow you to extend HCM's physical capabilities.

Physical descriptions are also used where required to handle unusual characteristics of physical strings containing I/O devices.

**Note:** The filename extension for physical description files was changed from ".pdf" to ".txt" for HCM 2.9 Service Level 3 and higher. Nevertheless, HCM 2.9 Service Level 3 and higher can still read physical description files having the extension ".pdf".

**physical-logical inconsistency.** A *physical / logical inconsistency* may occur when a physical route exists but a logical definition is missing, or when a logical definition exists without a physical pathway.

**physical object.** Physical objects exist; for example, the physical processor or machine has a serial number and a set of channels. Each physical object generally has a corresponding logical object; exceptions are physical cabinets, patchports and crossbar switches. You can add these physical objects to your configuration diagram after the IODF load, to more accurately portray your hardware configuration.

**physical route.** A physical *route* or *connection* provides a pathway between logical objects (such as control units and CHPIDs) that can be used by logical definitions.

**port group.** Panels are organized into *port groups* of *patchports*, arranged side by side. A port group is the smallest number of *patchports* (typically six or three) that can be individually installed or uninstalled.

**PPRC.** See peer-to-peer remote copy.

**primary processor.** *Primary* refers to a processor which is the current logical view of its assigned machine. At IODF Load / Resync time, the machine connections are built only for primary processors.

**processor.** The *physical processor*, or machine, has a serial number, a set of channels, and a *logical processor* associated with it. The logical processor has a number of channel path IDs, or *CHPIDs*, which are the logical equivalent of channels. The logical processor may be divided into a number of logical *partitions* (LPARs).

**production configuration file.** The *production configuration file* (\*.HCR file) is the equivalent of the production IODF, but is located on the PWS. You are not allowed to modify the content of a production configuration file. The production configuration file and the production IODF form an associated pair. See also *configuration files*.

## R

**reconciliation of VOLSERs.** The term *reconciliation* describes the process of synchronizing the VOLSER values in the PWS configuration file with those in the IODF.

**reconfigurable CHPID.** A *reconfigurable CHPID* is an unshared CHPID that you can reconfigure offline from one partition, then online to another. That is, the CHPID can be reconfigured between logical partitions after a power-on reset. Only one partition can access I/O devices on this CHPID at a time. All CHPID types can operate in REC (reconfigurable) mode.

**report.** You can specify certain parameters to compile and print HCM information as a *report*.

**resync [IODF resync].** If an IODF file has been replaced or updated since its associated config file was saved, the IODF file and config file will be out of sync. HCM will resynchronize with the host IODF in these cases by reloading the IODF and making any appropriate physical changes.

## S

| **SAID.** See system adapter identifier.

**section.** Dialog option: groups similar dialog options together for easier viewing.

**segment.** Certain types of controller, such as the 3990, are divided into two separate sections, or *segments*. Note that in the 3990 controller, segments may be referred to as "storage clusters"; other controllers may refer to them as "busses". DASD controllers typically contain two segments; most other types of controller contain only one.

**shared CHPID.** A *shared CHPID* can be configured online to one or more partitions at the same time. One or more partitions can access I/O devices at the same time using this CHPID.

| **SSID.** See subsystem identifier.

**SNA address.** The system network architecture (SNA) address is used to identify the support element of a central processor complex (CPC) configured in a S/390 microprocessor cluster. The SNA address comprises the name of the network to which the CPC is connected, and the system name identifying the CPC within the network. The SNA address is part of the processor definition for a CPC, associating the processor defined in the IODF with the CPC configured in the S/390 microprocessor cluster.

**standalone mode.** This mode of operation of HCM allows you to open a configuration without a connection to the host.

**string.** A *string* refers to a collection of one or more I/O devices. The term usually refers to a physical string of units, but may mean a collection of I/O devices which are integrated into a control unit.

**string interface.** A string has a number of *string interfaces* on the top which connect to controller device interfaces, and eventually to processor CHPIDs.

**subsystem identifier.** A subsystem identifier (SSID) represents the four-digit hexadecimal number that is programmed into the hardware when it is installed, which uniquely identifies a logical control unit to a host system. For HCM purposes, the SSID is only required for integration with other PPRC tools (like RCMF). Typically, each DASD logical subsystem involved in a PPRC connection is labeled with a unique SSID, but it is usually not applied to non-DASD logical subsystems.

**switch.** A device that provides connectivity capability and control for attaching any two ESCON or FICON links together.

**switch configuration.** You can create a set of connection rules called a *switch configuration*, which can be used to determine which switch ports are connected internally (activated) at any one time. That is, you can dynamically restrict connections between switch ports. Each switch configuration deems that only certain connections are “on”; that is, only certain intersections between internal switch ports are active. Any switch port may connect to any other switch port.

The control unit inside the switch can receive messages from the processor, dynamically setting the configuration for the switch ports at that time. HCM allows you to create, view, edit or delete switch configurations.

**switch connectivity.** The *switch connectivity* comprises the internal connections between switch ports. Switch connectivity is dynamically set by switch configurations.

**switch controller.** The *switch controller* contained in an ESCON or FICON switch receives and interprets processor messages to set the switch configuration dynamically. This controller is not drawn in the configuration diagram.

The switch controller contains the *switch's control unit*, which is always connected to its switch port with the address FE. The switch's control unit is connected to a *device*, also within the switch. You can edit the control unit and device as you would normally.

**switch's control unit.** The *switch's control unit* resides in the controller within a switch. It can receive messages from the processor, dynamically setting the configuration for the switch's ports at that time. This control unit is always connected to the switch port with the address FE, and to a device, also in the switch.

**switch's devices.** The devices which are defined to the switch's control unit to control a switch are called switch's devices, they are internal to the switch. See also *switch controller*.

**switch port.** A switch port is an interface on the switch which can connect to a processor CHPID either directly or via another switch, or to a controller channel interface.

**subsystem.** Some controller types can be grouped together in a *subsystem*. For example, 3990 dual frame controllers or 3803s linked via communications cables

**symbolic destination name.** The symbolic destination name (SDN) relates the host name known to you to a partner LU (Windows 9x/NT), mode name (VTAM), and TP name (APPC/MVS).

**system adapter identifier.** A system adapter identifier (SAID) represents the two or four-digit hexadecimal number that is programmed into the hardware when it is installed, which uniquely identifies a physical channel interface on the controller.

## T

**text box.** Dialog option: click in a text box and type in data. Use TAB or SHIFT-TAB to move between text boxes in a dialog.

**trunk cable.** *Trunk cables* are generally used to make permanent connections between cabinets which remain even when not in use.

## U

**unit.** A *unit* is a collection of I/O devices in a physical box. There can be several units in a string; the first unit, known as the *head of string*, contains *string interfaces* which connect to controller device interfaces.

**unused cable.** *Unused cables* are physical cables that have been recently disconnected, but not yet placed in inventory. Think of them as lying on the floor, ready to be reused. Unused cables “remember” where they were last used.

## W

**work configuration file.** The *work configuration file* (\*.HCM) contains HCM's interactive configuration diagram. You can modify and save different versions of your hardware configuration in a number of work configuration files for historical and planning purposes. The work configuration file and the work IODF form an associated pair. See also *config file* and *configuration files*.

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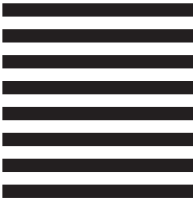
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